

## On new Forms, &amp;c., of extra-European Trichopterous Insects.

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(PLATES II, III. &amp; IV.)

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THE present paper may be regarded as a continuation of several memoirs by me on exotic *Trichoptera*, published in the 'Transactions of the Entomological Society of London' (Trans. Ent. Soc. ser. 3, vol. i. pp. 301-312, 492-496, vol. v. pp. 247-278). Many of the insects here noticed I owe to the liberality of my valued correspondent Mr. Henry Edwards, of San Francisco, from whom I had already, during his residence in New Zealand, received such substantial evidence of his desire to assist me by collecting these neglected insects, and who, since he has made Western America his home, has continued to help me. I have not, however, confined myself here solely to Californian species, but have added several remarkable forms from other parts of America, and also from the Old World. No doubt it is always advisable to restrict general papers of this nature within geographical limits; but this applies most forcibly to families which have already been made the subjects of general study. To follow this plan in exotic *Trichoptera* would be almost impossible, inasmuch as, though occasionally a considerable number of species may be collected in one locality by an entomologist who attends to other insects besides the almost hackneyed Butterflies and Beetles, many interesting forms must remain unnoticed in collections for years, because they are the results of only desultory observation on the part of collectors. This, therefore, must be my excuse for the scattered nature of the materials in this paper. When the day shall arrive when Neuropterists may be as plentiful as Lepidopterists, Coleopterists, and even Hymenopterists now are, it will then be absolutely necessary that workers should confine themselves, in each paper, within limits, either of locality, or family, or genus; to do that now would put a stop to all work, because, by the omission of any notice, collectors would fail to bestow any attention whatever on these insects, and the evil would be increased rather than mitigated. As in previous papers, I have endeavoured to illustrate by means of outline figures those intricate points of neururation and secondary sexual characters which form so essential a part in the

study of *Trichoptera*, and which can often be explained intelligibly by a few strokes of the pencil, however inartistic these may be, when words fail to illustrate the meaning.

It may not be out of place here to say a few words on the systematic position of the *Trichoptera*. The remarks that follow have, to a certain extent, been excited by a recently published American work, by Dr. J. S. Packard, jun., entitled a 'Guide to the Study of Insects,' a work strikingly original in its conception, and one which will doubtless do much towards furthering the already rapidly increasing taste for entomological studies in the United States. But it is necessary, first of all, just to glance at the position generally accorded to the *Neuroptera*. It has long been seen that the order, as defined by Linné, is composed of most incongruous materials; and Erichson attempted an amelioration of this condition by grafting all those families with incomplete metamorphosis upon the *Orthoptera*, still maintaining the two orders in juxtaposition. Since his time various authors have made this division, termed *pseudo-Neuroptera*, a veritable refuge for the destitute. To it have been added, from time to time, *Mallophaga*, *Thysanura*, *Thysanoptera*, and even the *Strepsiptera*, for no other reason, so far as I can see, than that they would not fit in satisfactorily elsewhere; and the characters of the order being so elastic, it was easy to find some peculiarities which gave these outlying families admission therein. That the Linnean families grouped now with *Orthoptera* have more affinity thereto than to the *Neuroptera* as usually constituted, is evident; yet I see no reason whatever why the *Odonata* should not form an order apart, possessing, as they do, characters absolutely *sui generis*. The admission of them into *Orthoptera* renders an already heterogeneous order an absolute chaos. For my part, I have been content to consider the *Neuroptera* as an order, in the Linnean sense, divisible into three great divisions, *pseudo-Neuroptera*, *Planipennia*, and *Trichoptera*,—but this only as matter of convenience; for I am convinced that contained therein are constituents of several orders, each of equal value with such as *Lepidoptera* and *Coleoptera*, and that the day will arrive when, from an increase of knowledge in embryology and anatomy, the order *Neuroptera*, as constituted by Linné, will be scattered widely—a dismemberment that would have occurred long since, only that there still exists a lingering disinclination to thoroughly upset the Linnean system.

Dr. Packard's arrangement is founded on the idea that in insects, as in all other divisions of the animal kingdom, there are certain groups more elevated, others more "degraded," than the rest. Acting upon this, he places the *Hymenoptera* as structurally and psychically, if I may use the term, superior to all other insects. Then follow *Lepidoptera*, *Diptera*, *Coleoptera*, *Hemiptera*, *Orthoptera*, and, last of all, the *Neuroptera*, in the Linnean sense (but including *Thysanura*), an order which, according to him, "mimics every suborder of insects," being "comprehensive or synthetic types, combining the structure of all the other suborders." I would here particularly call attention to the relative positions occupied by *Lepidoptera* and *Trichoptera*, the latter forming nearly the last division of *Neuroptera*. I emphatically enter my protest against such a wide separation of the two groups, considering, as I do, that, whatever may be the condition of the *Trichoptera* with regard to others of the Linnean groups of *Neuroptera*, their relationship to the *Lepidoptera* is close, and that an attempt to thus widely separate them is an outrage on both. In metamorphosis the resemblance is nearly complete, the fact of the pupal limbs not being enclosed within a common integument not availing much when their condition in certain *micro-Lepidoptera* is taken into consideration: the possession of mandibles by the Trichopterous nymph is not of much importance, inasmuch as these organs bear no relationship to the aborted mandibles of the imago; they simply replace the acid or mechanical means by which a Lepidopterous imago frees itself from its cocoon. The imago in *Lepidoptera* is almost constantly furnished with scales on the wings and body, scales of a peculiar nature, the analogues of which are seen only in *Lepisma*; but many Trichopterous insects have, in the male, a modification of these scales in the form of short inflated hairs, generally intermingled with ordinary hairs; and in some genera this tendency towards a scaly clothing is as marked as is its absence in some *Lepidoptera*. The neural arrangement is not at all incompatible with a close relationship; nor are the parts of the mouth, excepting the absence of a developed haustellum; yet many of the larger *Trichoptera* frequent flowers for the purpose of extracting the nectar; and though I am unable to say by what means this is effected, it seems probable that it is done by prolongation, at will, of the upper portion of the œsophagus into a sort of false haustellum. Perhaps the

strongest mark of demarcation is the presence, in most Lepidopterous imagos, of a spine-like process near the base of the costa of the hind wings, wanting in all *Trichoptera*. That this process is a modification of a vein is almost certain; and I apprehend that, when the homologies of neururation are better understood, this negative character in *Trichoptera* will not be found of much importance. My own inclination tends strongly towards maintaining *Trichoptera* as a separate order in juxtaposition with *Lepidoptera*; and I am thus content to share the pity bestowed by the reviewer of Huxley's 'Introduction to the Classification of Animals,' in the 'American Naturalist' (a journal receiving Dr. Packard's inspiration) for November 1869, by whom we are told that (p. 545), "the strangest, and, humanely speaking, saddest feature of this classification, is recognizing the Neuropterous family Phryganeidæ as a distinct order (*Trichoptera*)." In a division of insects such as the Linnean *Neuroptera*, which is so thoroughly heterogeneous, much allowance should be made for differences of opinion, and it is scarcely fair to bestow such dogmatic censure upon any system, however opposed it may be to individual convictions.

### Family PHRYGANEIDÆ.

The following is an attempt at a systematic and synonymic catalogue of all the described species of this family, taken in its limited sense. The genera are not well-defined, notwithstanding the size of the insects, the neural characters not being sufficiently stable, or rather, perhaps, the materials at present in hand being too meagre, to enable me to draw lines of demarcation absolutely satisfactory. A few notes on the general characters are here given.

*Colpomera*, McLachlan, which I was inclined to place as a section of *Phryganea* in its limited sense, on account of the strong facial resemblance of the type to *P. japonica*; is evidently a good genus. The general characters are as in *Phryganea*; but the anterior wings are narrower, the apex being falcate, the apical margin strongly excised. The apex of the abdomen of the female (which sex I have only recently seen) is produced into a telescopic tube, indicating some peculiar mode of life, and quite different from the blunt apex of *Phryganea*. The neururation differs in the sexes, as in *P. grandis* and allies.



*Phryganea*, Linné (as restricted), has moderately narrow anterior wings, the apex of which is rounded, oblique, or slightly sinuate. In the typical species there is an additional apical cellule in the ♀ in all the wings; but in a section of the genus the neurulation is similar in both sexes, or as in the ♂ of the typical species (*Trichostegia*, Hag., Brauer); and in another section the anterior wings have the like neurulation in both sexes, but the posterior wings possess an additional fork. The discoidal cell of the anterior wings is elongate in all.

*Holostomis*, Mannh., differs from *Phryganea* in its very broad anterior wings. In the typical species, the neurulation of the anterior wings is alike in both sexes (similar to the typical forms of *Phryganea* ♂), but the posterior wings of the ♀ have an additional fork; *H. MacLachlani*, White, has the additional fork in all the wings of the ♀; and on this account I transferred it to *Phryganea*; but, in its form, it is evidently better placed here.

*Neuronia*, Leach, is scarcely to be separated from *Holostomis*: the species are, as a rule, smaller, with the discoidal cell shorter; but possibly the two genera should be united under *Neuronia*, which is the older name. The neurulation of the anterior wings is alike in both sexes; but the posterior wings of the ♀ have an additional fork.

*Agrypnia*, Curtis, is distinguished by the narrow, Limnophili-form anterior wings, the neurulation alike in both sexes, the spines of the tibiae and tarsi few in number,—at present one of the best-defined genera.

#### COLPOMERA, *M'Lachlan*.

1. *C. SINENSIS*, *M'Lach. Trans. Ent. Soc. Lond. ser. 3, vol. i. p. 302.*  
*Hab.* North China.

#### PHRYGANEÆ, *Linné* (restricted).

= *Trichostegia*, Kolenati.

*A. Alæ anticæ et posticæ fæminis furca apicali addita instructæ*  
(= *Phryganea*, Hag., Brauer).

2. *P. JAPONICA*, *M'Lach. Trans. Ent. Soc. Lond. ser. 3, vol. v. p. 248.*  
*Hab.* Japan.
3. *P. GRANDIS*, *Linn. F. S. 379; Hag. Linn. Ent. vol. v. p. 363.*—

*Trichostegia grandis*, *Kol. Gen. et Sp. Trichop.* pt. 1, p. 84.—*P. atomaria*, *Steph. Ill.* vol. vi. p. 206.

*Hab.* Europe.

4. *P. STRIATA*, *Linn. F. S.* 378; *Hag. Linn. Ent.* vol. v. p. 363.—*P. Beckwithii*, *Steph. Ill.* vol. vi. p. 206.—*P. fulvipes*, *Burm. Handb.* vol. ii. p. 934.

*Hab.* Europe.

5. *P. CINEREA*, *Walk. Cat. Brit. Mus. Neurop.* pt. 1, p. 4; *Hag. Neurop. N. Amer.* p. 252.—*P. divulsa*, *Walk. Trans. Ent. Soc. Lond.* ser. 2, vol. v. p. 176 (locality erroneous).

*Hab.* North America.

6. *P. VARIA*, *Fab. Ent. Syst.* p. 77; *Pict. Recherch.* p. 160, pl. xi. f. 1.—*Trichostegia varia*, *Kol. Gen. et Sp. Trichop.* pt. 1, p. 86.—*P. annularis*, *Oliv. Encyc.* vol. vi. p. 558.—*P. variegata*, *Humm. Ess.* ii. p. 23.

*Hab.* Europe.

7. *P. SORDIDA*, *M'Lach. post.* p. 106.

*Hab.* Japan.

8. *P. OBSOLETA* (*Hagen*), *M'Lach. Trans. Ent. Soc. Lond.* ser. 3, vol. v. p. 16.

*Hab.* North and Central Europe.

B. *Alæ posticæ fæminis furca apicali addita instructæ.*

9. *P. VESTITA*, *Walk.*—*Neuronia vestita*, *Walk. Cat. Brit. Mus. Neurop.* pt. 1, p. 10, ♀.—*P. vestita*, *Hag. Neurop. N. Amer.* p. 253.—*N. commixta*, *Walk. l. c.* ♂.—*P. commixta*, *Hag. l. c.*

*Hab.* United States.

C. *Venæ alarum ant. et post. in utroque sexu ut in mare divisionis* A. (= *Trichostegia*, *Hag.*, *Brauer*).

10. *P. MINOR*, *Curt. Phil. Mag.* 1834, p. 125; *B. E.* pl. cxii.—*Trichostegia minor*, *Kol. Gen. et Sp. Trichop.* pt. 1, p. 87.—*P. mixta*, *Burm. Handb.* vol. ii. p. 934.—*P. tortricæana*, *Ramb. Neurop.* p. 471.

*Hab.* North and Central Europe.

#### HOLOSTOMIS, *Mannerheim.*

A. *Venæ alarum ant. et post. ut in divisione* A. *Phryganææ.*

11. *H. MACLACHLANI*, *White, Trans. Ent. Soc. Lond.* ser. 3, vol. i. Proc. p. 26.—*P. Maclachlani*, *M'Lach. Trans. Ent. Soc. Lond.* ser. 3, vol. v. p. 249, pl. xvii. fig. 1.

*Hab.* North India.

Var. *REGINA*, *mihi* (an sp. distincta?).

*Hab.* Japan.

B. *Alæ posticæ fœminis furca apicali addita instructæ; venæ alar. antic. in utroque sexu ut in mare divisionis A. Phryganeæ.*

12. H. PHALÆNOIDES, *Linn.*—P. phalænoides, *Linn. F. S.* p. 378.—H. phalænoides, *Kol. Gen. et Sp. Trichop.* pt. 1, p. 82.—P. speciosa, *Lat. H. N.* vol. xiii. p. 86.—P. daurica, *Fisch. Ent. Russ.* p. 52, pl. (Neurop.) ii. f. 1.

*Hab.* North Europe.

13. H. ATRATA, *Lepchn.*—P. atrata, *Lepchn. Iter Sibir.* vol. ii. pl. x. f. 9.—H. atrata, *Hag. Ent. Ann.* 1859, p. 70.—P. altaica, *Fisch. Ent. Russ.* p. 52, pl. (Neurop.) ii. f. 2.

*Hab.* Lapland; Russia; Finland.

14. H. MELALEUCA, *M'Lach. post* p. 106.

*Hab.* Japan.

*Note.*—The variety of *H. Maclachlani*, from Japan, indicated under the name of *regina*, is perhaps a distinct species. I have only seen one female example, lent to me by Baron De Selys Longchamps. It differs from the Indian specimens in the anterior wings being much narrower, elliptical at the apex; the markings of these wings darker, the apical portion of each wing being black, with few yellow irrorationis; the costal spots elongate and not divided; the basal portion of the hind wings much darker, blue-black, this colour extending further along the costal margin; the apical band broader; hence the yellow band is narrower, and there are no spots on the costal portion of this band: beneath, the dark portion of these wings is intensely blue-black.

#### NEURONIA, *Leach.*

15. N. PARDALIS, *Walk. Cat. Brit. Mus. Neurop.* pt. 1, p. 7; *Hag. Neurop. N. Amer.* p. 250.

*Hab.* Nova Scotia.

16. N. SEMIFASCIATA, *Say.*—P. semifasciata, *Say, West. Quart. Rep.* ii. p. 161; *Amer. Ent.* vol. ii. p. 97, pl. xlv.—N. semifasciata, *Hag. Neurop. N. Amer.* p. 250.—N. fusca, *Walk. Cat. Brit. Mus. Neurop.* pt. 1, p. 9.—Ptilostomis Kovalevskii, *Kol. Gen. et Sp. Trichop.* pt. 2, p. 198, pl. i. f. 1.

*Hab.* North America.

17. N. POSTICA, *Walk. Cat. Brit. Mus. Neurop.* pt. 1, p. 8; *Hag. Neurop. N. Amer.* p. 251.

*Hab.* North America.

18. *N. OCELLIFERA*, Walk. Cat. Brit. Mus. Neurop. pt. 1, p. 8; Hag. Neurop. N. Amer. p. 252.

Hab. North America.

19. *N. CONCATENATA*, Walk. Cat. Brit. Mus. Neurop. pt. 1, p. 8.—*N. irrorata*, Hag. Neurop. N. Amer. p. 249 (*nec* Fab.).

Hab. North America.

20. *N. LAPPONICA*, Hag.—*P. reticulata*, var., Zett. Ins. Lapp. col. 1061 (*nec* Linn.).

Hab. Lapland; Island of Oesel.

21. *N. RETICULATA*, Linn.—*P. reticulata*, Linn. F. S. p. 378.—*Oligostomis reticulata*, Kol. Gen. et Sp. Trichop. pt. 1, p. 81, pt. 2, pl. v. f. 57.—*N. reticulata*, Brauer, N. A. p. 44.

Hab. North and Central Europe.

22. *N. CLATHRATA*, Kol.—*O. clathrata*, Kol. Gen. et Sp. Trichop. pt. 1, p. 82.—*H. clathrata*, Hag. Ent. Ann. 1859, p. 69.

Hab. North and Central Europe.

23. *N. OCELLIGERA*, Walk. Cat. Brit. Mus. Neurop. pt. 1, p. 8; Hag. Neurop. N. Amer. p. 259.

Hab. Nova Scotia.

24. *N. STALII*, M<sup>c</sup>Lach. Trans. Ent. Soc. Lond. 1868, p. 289.

Hab. Sweden.

25. *N. RUFICRUS*, Scop.—*P. ruficrus*, Scop. Ent. Carn. p. 690.—*N. ruficrus*, Brauer, N. A. p. 68.—*N. fusca*, Steph. Ill. M. vi. p. 234, pl. xxxiv. f. 2.—*P. striata*, Burm. Handb. vol. ii. p. 935.—*Oligotricha chloroneura*, Ramb. Nérop. p. 473.—*Anabolia analis*, Kol. Gen. et Sp. Trichop. pt. 1, p. 80.

Hab. Europe.

*Note*.—Walker's three species, *N. fusca*, *postica*, and *ocellifera*, are doubtfully distinct according to the types; the names are here used in accordance with the sense in which Hagen has applied them in his 'Neurop. N. America.'

*N. concatenata* is very closely allied to *N. lapponica*; *N. ocelligera* to *N. clathrata* and *N. reticulata*.

#### AGRYPNIA, Curtis.

26. *A. PICTA*, Kol. Gen. et Sp. Trichop. pt. 1, p. 79.

Hab. North Europe.

27. *A. PAGETANA*, Curt. B. E. pl. dxi.—*P. ægrota*, Burm. Handb. vol. ii. p. 935.—*Oligotricha strigosa*, Ramb. Nérop. p. 473.

Hab. North and Central Europe.

*Note*.—Two as yet undescribed species of *Agrypnia* in Hagen's LINN. JOURN.—ZOOLOGY, VOL. XI.



collection are noticed by name only, viz. *A. glacialis*, Hag., from North America, and *A. islandica*, Hag., from Iceland.

### PHRYGANEÆ, *Linné*.

PHRYGANEÆ SORDIDA, nov. sp. *P. variæ* affinis, sed alis anticis latioribus, fusco-griseis fusco plus nebulosis; alæ posticæ ad apicem anguste fusco-limbatae (♀).

Long. corp.  $7\frac{1}{2}$  lin. (=15 mill.); exp. alar.  $18\frac{1}{2}$  lin. (=39 mill.).

*Hab.* Japonia (in *Mus. auct.*).

Evidently allied to *P. variæ*, and perhaps scarcely more than a form of that species. The insect, however, is more robust and rather larger; the anterior wings broader, more clouded with fuscous, especially in the basal half, which is almost entirely fuscous; the ground-colour brownish grey, instead of the whitish grey of *variæ*; the hind wings with a narrow, smoky-fuscous, apical margin. The anal parts are similar to those of *variæ*, only that the lateral lobes seem to be larger and more quadrate.

I have one female example, from Hakodadi.

### HOLOSTOMIS, *Mannerheim*.

HOLOSTOMIS MELALEUCA, n. sp. *H. atra*, nitida. Pedes abdomenque sordide nigri. Alæ anticæ pallide stramineæ, punctis nigris sat dense conspersæ; posticæ albæ, maculis duabus costalibus ante apicem ornatae, late fusco-limbatae (♂). Long. corp.  $7\frac{1}{2}$  lin. (=15 mill.); exp. alar. 24 lin. (=50 mill.).

*Hab.* Japonia (in *Mus. Brit.*).

*Head* and *thorax* deep shining black (antennæ broken): palpi and legs dull black with a greyish tinge. *Abdomen* dull black: a long triangular superior median lobe, shining black, directed strongly downwards, notched at the acuminate apex, and bearing, before the apex, a needle-shaped process on either side: penis long, flattened, awl-shaped, testaceous (there are also two small testaceous processes which apparently belong to the app. sup.).

*Anterior wings* very pale straw-colour, rather densely irrorated with small black spots, some of which are confluent and form reticulations; two larger costal spots near the apex, some larger spots towards the inner margin; the apical margin regularly spotted; veins pale, except where they traverse the black markings. *Posterior wings* white, subopaque; a large wedge-shaped black spot on the costal margin above the discoidal cell, the point nearly reaching it; beyond this, nearly at the apex, a second large, irregular, black spot; one or two small black dots near the middle of the costa; apex and apical margin broadly fuscous, with a semilunate pale straw-coloured mark on the extreme margin in each apical cellule; veins pale.

There is one ♂ example in the British Museum, from Hakodadi. The species is evidently allied to *H. atrata*, Lepchn. (*altaica*, Fischer), but differs in its black legs, and in the complete, broad, fuscous margin of the hind wings.

Fam. LIMNOPHILIDÆ.

GRAMMATAULIUS, *Kolenati*.

GRAMMATAULIUS BREVILINEA, n. sp. G. fusco-niger, subtus griseo-ochraceus; capite, prothorace, mesothoraceque in medio lurido-rufis. Pedes griseo-flavi; tibiis tarsisque nigro-spinosis. Alæ anticæ angustatæ, elongatæ, ad apicem vix dilatatæ; margine apicali obliquo, paullo exciso; testaceæ, rufo-brunneo nebulosæ, pterostigmate, area suturali cellulaque apicali tertia fuscis, lineis duabus brevibus in area interclavali nigris; posticæ albidæ, hyalinæ, ad apicem flavescentes; cellula apicali tertia pallide fuscescente (♀). Long. corp. 8 lin. (= 16 mill.); exp. alar. 20 lin. (= 43 mill.).

*Hab.* Japonia (*in Mus. auct.*).

*Head* above lurid reddish, suffused with fuscous in the middle, quite flat, triangularly produced in front, truncate behind; face and palpi testaceous; eyes black, reticulated with grey, *Pronotum* large, transversely quadrangular, divided in the middle by a longitudinal line, reddish. *Mesonotum* broadly black at the sides, and with a broad longitudinal reddish middle band. *Metanotum* black, somewhat piceous. The whole under-surface of the body greyish ochreous. *Legs* greyish yellow, tibiæ and tarsi with numerous black spines, anterior femora sometimes fuscous internally. *Abdomen* fuscous above, greyish ochreous beneath: in the female are two long, cylindrical, testaceous, divergent, finger-shaped appendices; beneath these a short, broad, up-directed plate, which is deeply excised at the apex, and two large, oval, obtuse, lateral valves (or inferior appendices). (Pl. II. fig. 1.)

*Anterior wings* long and narrow, the costal inner margins nearly parallel, the apex slightly dilated, the apical margin oblique, excised at the sixth apical cell: colour dull testaceous, suffused with pale reddish brown, the apical portion with paler irrorations; pterostigma fuscous, third apical cell fuscous with some pale dots, sutural area fuscous, but leaving the extreme inner margin pale; area interclavalis with two short longitudinal black lines; veins testaceous. *Posterior wings* broad, subhyaline, the apex and pterostigmatal region yellowish; third apical cellule suffused with pale fuscous; radius crossing the first apical sector at its extremity, forming a fork. (The neuration in each of my two examples is irregular: in one the third apical sector in both anterior wings, and in the right posterior wing, is furcate at its extre-

mity; in the other this sector divides from, or soon after, its commencement, and joins again before the extremity in all the wings, forming a long loop).

I have two females from Japan. It is a true *Grammataulius*, and a very strongly marked species.

### STENOPHYLAX, *Kolenati*.

STENOPHYLAX GENTILIS, nov. sp. *S.* pallide testaceus. Antennæ pedesque testacci; tibiis tarsisque nigro-spinosis. Abdomen supra nigro-terminatum; appendicibus superioribus parvis, brevibus, fimbriatis, flavis; app. inf. sursum directis, fimbriatis, flavis, ad apicem nigro-truncatis, dentatis. Alæ anticæ elongatæ, gradatim dilatatæ, pallide flavæ, immaculatæ, subnitidæ; venis flavis; anastomosibus fuscis; margine apicali anguste obscuriore; posticæ pallidiores (♂).

Long. corp.  $5\frac{1}{2}$  lin. (=11 mill.); exp. alar. 17 lin. (=36 mill.).

*Hab.* America boreali (in *Mus. auct.*).

The whole body, including antennæ, palpi, and legs, testaceous; tibiæ and tarsi with black spines; eyes black. The last dorsal segment of the abdomen is conically produced at its apex, which is black and scabrous; app. sup. small, rounded, concave internally, yellow, and fringed with yellow hairs; app. intermed. black, truncate (?); app. inf. directed upwards, yellow, fringed externally with long yellow hairs, the apex black and truncate, furnished with small teeth.

*Anterior wings* elongate, broad, the apex parabolic, nearly uniformly pale yellow, almost nude, and shining, the membrane finely rugulose; inner margin (area suturalis) deeper yellow; apical margin narrowly obscure; veins yellow, the anastomoses fuscous; a whitish dot at the thyridium, and another at the areulus. *Posterior wings* hyaline, tinged with yellow; anterior margin deeper yellow.

I have one male, from the White Mountains of New Hampshire, sent by Mr. H. Edwards, of San Francisco. The species is allied to the European *S. hieroglyphicus*, *striatus*, &c., in which the wings are elongate, and the first apical cell in the anterior pair scarcely longer than the succeeding cells.

*S. LIMBATUS*, nov. sp. *S.* rufo-testaceus. Antennæ testacæ, fusco-cingulatæ. Pedes flavi. Abdomen supra fuscum, infra ochraceum; segmento ultimo lateraliter productum; app. sup. parvis, subquadratis, flavo-fimbriatis; app. inf. sursum directis, ad apicem truncatis, extus fimbriis longis instructis; app. intermed. elongatis, spiniformibus, rectis, ad apicem abrupte uncinatis. Alæ anticæ breves, latæ, ad apicem valde obtusæ, testacæ; nebula in cellula thyridii (puncto albo ad thyridium incluso) maculis duabus (una ad basin cellulæ apicalis

secundæ, altera quartæ) limboque apicali intus dentato pallide brunneis: posticæ hyalinæ (♂).

Long. corp.  $4\frac{1}{2}$  lin. (=9 mill.); exp. alar.  $12\frac{1}{2}$  lin. (=26 mill.).

Hab. Terra Nova (in Mus. auct.).

*Head* and *thorax* reddish testaceous, with sparse reddish hairs; antennæ testaceous, with fuscous rings; palpi yellowish; eyes black. *Legs* yellow, tibiæ and tarsi with short black spines, a black point on each trochanter, internally. *Abdomen* fuscous above, ochreous beneath; margin of last dorsal segment regularly concave in front, produced at the sides into a triangular tooth, the upper edge of which is excised and beset with numerous very short black spiny hairs; app. sup. small, yellow, subquadrate, truncate, fringed with yellow hairs; app. intermed. long, in the form of two closely applied straight spines, the tips of which are suddenly curved downwards; app. inf. directed upwards, projecting beyond the lateral production of the segment, yellow, truncate at the apex, and fringed externally with long yellow hairs.

*Anterior wings* short and broad, much dilated at the apex; the apical margin oblique, pale testaceous, the membrane finely rugulose, nearly nude, and shining; a cloud in the cellula thyridii extending also above it, and there enclosing a white dot at the thyridium; two irregular spots, one placed at the base of the second, the other in a similar position in the fourth, apical cells, and a broad apical margin which is dentate internally (being produced into an acute triangle along each apical cell) pale brown; ramus clavalis margined beneath with brown; veins testaceous, with short concolorous hairs; first apical cell longer than the second, but not inordinately so. *Posterior wings* hyaline, whitish, slightly yellowish at the apex; veins pale yellowish; fifth apical cell scarcely reaching the anastomosis. (Pl. II. fig. 2.)

I have two males, taken at St. John's, Newfoundland, by Mr. G. F. Mathew. In the form of the wings the species approaches *S. dubius*, *punctatissimus*, &c.; but the first apical cell in the anterior wing is much shorter than in those species.

#### PLATYPHYLAX, nov. gen.

Characteres ut in *Stenophylaci* (sensu stricto), sed calcarium formula 1, 2, 2.

Agreeing in almost every respect with the typical forms of *Stenophylax* (e. g. *hieroglyphicus*, *striatus*, &c.), but with only 1, 2, 2 spurs instead of 1, 3, 4.

I form this genus for the reception of some insects that have been placed in *Enœcylla* on account of their spur-formula being identical (i. e. so far as the winged male of *Enœcylla* is concerned), but which are evidently very closely allied to *Stenophylax* and



should be placed next thereto. I have already (Stettiner entomologische Zeitung, 1867, p. 54) separated certain forms with the same number of spurs into a distinct genus under the term *Potamorites*; but these, in the narrower form, and pouched hind wings of the male, come near *Drusus*. *Platyphylax* is really so near *Stenophylax* that, without examining the spurs, the species might pardonably be supposed to pertain to the latter.

In *Platyphylax* should be placed the European *E. Frauenfeldii*, Brauer and *E. Kolenatii*, Kol. (= *Frauenfeldii* ♂?), the North-American *E. subfasciata*, Say, *E. designata*, Walker, and *E. lepida*, Hagen, and the Chinese species described below as *P. lanuginosus*.

*E. irrorata*, F. (= *intercisa*, Walk., Hag.), and *E. præterita*, Walk., probably form another genus. *E. areolata*, Walk., is probably a true *Enæcylla*; but it is desirable to see the female.

PLATYPHYLAX LANUGINOSUS, nov. sp. *P. fuscus*, abdomine ochraceo.

Antennæ palpique fusco-nigri. Pedes flavi, tibiis tarsisque fusco-nigris. Alæ anticæ latæ, testaceo-fuliginosæ, dense et breviter testaceo-hirsutæ; venæ pilis erectis fuscis fimbriatæ: posticæ fuliginoso-subhyalinæ, margine costali apicem versus flavido (♀).

Long. corp. 7 lin. (=15 mill.); exp. alar. 18 lin. (=37 mill.).

*Hab.* Shanghai (in *Mus. auct.*).

*Head* fuscous above, posterior margin and a small tubercle on each side close to the eyes testaceous; ocelli white; antennæ blackish, the basal joint with blackish hairs, a few testaceous ones being intermingled; face ochraceous; palpi blackish. *Thorax* fuscous above, ochraceous beneath; posterior half of metanotum yellowish. *Legs*: coxæ, trochanters, and femora testaceous; tibiæ and tarsi fuscous, armed with numerous short blackish spines. *Abdomen* ochraceous; at the apex are two short and obtuse appendices (my individual carries at the extremity of its abdomen a dried mass of gelatinous matter, such as envelops the eggs).

*Anterior wings* broad, the apical margin oblique, somewhat sinuate, and narrowly darker; the colour is smoky with a testaceous tinge; and there is a uniformly dense, almost woolly clothing of short procumbent testaceous hairs, intermingled with which are short, erect, blackish hairs; and on the veins, especially on the cubitus, are longer, erect, blackish hairs; a white dot at the thyridium, and another at the arculus; veins pale fuscous; first to fourth apical cells all more or less truncate at the base, fifth acute, scarcely reaching the anastomosis, furnished with a short footstalk; a black horny dot at the base of the third apical cell. *Posterior wings* smoky subhyaline; veins blackish-fuscous; apical portion of costal margin, and the subcosta and radius at that portion yellowish.

I have one female, from Shanghai, taken by Mr. W. B. Pryer.

## NEOPHYLAX, gen. nov.

Calcaria 1, 2, 4. Alæ anticæ dense pubescentes, apicem versus gradatim dilatatæ, margine apicali sinuato; cellula discoidali elongata: posticæ cellulis apicalibus 5 instructæ. Abdomen infra apicem versus dentibus duobus instructum ( $\sigma$ ).

*Head.* Antennæ about the length of the wings, moderately short, the basal joint longer than the head. *Eyes* large. *Ocelli* present. *Maxillary palpi* with short and oval basal joint; second joint long, gradually thickened; third joint rather shorter than the second, cylindrical: labial palpi with two short and thick basal joints, and a longer, slender, and cylindrical terminal joint. *Thorax* short. *Abdomen* slender: penultimate and antepenultimate segments each furnished with a tooth beneath: appendices little prominent. *Legs* moderately long; tibiæ and tarsi with few spines: spurs 1, 2, 4; the inner subapical spur on the posterior tibiæ very small, scarcely more than a tooth-like tubercle; the other pairs subequal.

*Anterior wings* clothed with dense short pubescence, and with short fringes; narrow at the base, gradually widened to the apex; apical margin oblique, slightly emarginate in the middle of the margin of the fourth apical cell, elevated at the point of termination of upper branch of the fork of the ramus thyrifer, and afterwards gradually emarginate to the anal angle, which is rounded; discoidal cell very long and narrow, closed; apical cells long and narrow, the first, third, and fifth acute, or subacute, at the base, and longer than the second and fourth; radius strongly bent before its termination. *Posterior wings* broad, the fringes long at the anal angle; subcosta and radius running very close together for more than half their length, then becoming confluent, or nearly so, afterwards disuniting, the radius then curved; ramus subdiscoidalis simple; hence there are only five apical cells (three apical and two subapical, according to the nomenclature of Kolenati); discoidal cell broad, closed ( $\sigma$ ).

A singular genus, which should probably be placed near *Apantania*, with which it agrees in its spur-formula and densely pubescent anterior wings. The shape of the anterior wings is peculiar, and the neuration of the posterior wings very remarkable in the small number of apical cells, in this respect unique in the family Limnophilidæ.

NEOPHYLAX CONCINNUS, nov. sp. *N.* testaceus. Pedes nigro-spinosi. Alæ anticæ fulvæ, fusco-pubescentes, punctis albidis obsolete irroratæ; margo dorsalis maculis tribus flavis ornatus; ciliis apicalibus fuscis, albido-interruptis; posticæ fumato-subhyalinæ.

Long. corp.  $3\frac{1}{2}$  lin. (=7 mill.); exp. alar.  $9\frac{1}{2}$  lin. (=20 mill.).

*Hab.* America boreali (in *Mus. auct.*).

*Head* (with the antennæ, palpi) and *thorax* testaceous; occiput, basal joint of antennæ, and prothorax clothed with testaceous, with an admixture of fuscous, hairs; and there is a fringe of similar hairs on the facial margin of the eye-sockets; eyes dark coppery. *Legs* testaceous, the posterior tibiæ paler; tibiæ and tarsi with few, short, black spines; spurs reddish-testaceous. *Abdomen* pale whitish testaceous; on the antepenultimate ventral segments is a very small, reddish-testaceous, triangular tooth, and on the penultimate segment a much larger tooth; appendices testaceous; app. sup. small, rounded, and ear-shaped, extending little beyond the cavity of the last segment; app. intermed. placed close together, proceeding from under the middle of the upper margin of the segment, nearly straight, and flattened laterally; when viewed from the side each appendage is seen to be dilated at the base, then with the upper margin excised to the apex, which is obtuse; app. inf. inserted close together on the ventral margin, band-like, curved strongly inwards, forming a deep incision when viewed from beneath, the apex obtuse.

*Anterior wings* fulvous, thickly clothed with short, procumbent, fuscous pubescence, the apical half irrorated with many small and indistinct whitish dots; inner margin with three yellow spots, viz. an elongate one at the base, a long triangular one about the middle, and a small one before the anal angle; the pubescence in the spaces between these spots is darker, almost blackish fuscous; apical fringe alternately fuscous and whitish; veins testaceous, the costal margin at the base, and the basal portion of the radius, ciliated with fuscous. *Posterior wings* subhyaline, slightly smoky; the fringes at the anal angle very long, silky, and whitish. (Pl. II. fig. 3, details.)

I received one male example from Mr. J. Angus, of the State of New York.

### Fam. SERICOSTOMATIDÆ.

#### NOTIDOBIA, *Stephens.*

*NOTIDOBIA GRISEOLA*, nov. sp. *N. nigro-fusca*. Caput prothoraxque cinereo-hirsuta: antennæ palpique fuscæ. Pedes flavescentes, antici omnino, femoribusque intermediis posterioribusque interdum fuscis. Abdomen fuscum, cinereo-hirsutum, linea utrinque pallida: appendices inferiores ♂ magnæ, truncatæ, supra in dentem uncinatum incurvatum intus productæ. Alæ anticæ griseæ, dense cinereo-pubescentes: posticæ pallidiores (♂, ♀).

Long. corp. ♂  $2\frac{1}{2}$  lin. (=6 mill.), ♀  $2\frac{3}{4}$ –4 lin. (=6½–8½ mill.); exp. alar. 9–12½ lin. (=19–26½ mill.).

*Hab.* California (*in Mus. auct.*).

Blackish fuscous. *Head* and *prothorax* clothed with whitish ashy-grey hairs, changing to fuscous on the face; antennæ fuscous, paler and

somewhat yellowish in some individuals; palpi fuscous, the maxillary pair in the ♂ very small and applied against the face; hinder margins of meso- and metanota yellowish. *Legs* yellowish; the anterior pair altogether fuscous, which colour sometimes pervades also the intermediate and posterior femora; coxæ blackish-fuscous. *Abdomen* fuscous, sometimes yellowish, with a pale line along each side, and clothed with ashy-grey hairs: appendices of ♂ yellow; app. inf. large, longer than broad, the apex truncate, the superior edge rounded, the apical margin furnished with an acute claw-shaped spine, which is turned inwards, these appendices fringed with yellowish-grey hairs; penis slender obtuse, straight, notched at the apex above. In the ♀ the abdomen is depressed, and at the apex is a large oval pouch, which is usually filled by a dark olive-green mass of eggs; but when empty the upper portion is seen to be furnished with a broad median lobe, on each side of which is a somewhat triangular valve.

*Anterior wings* grey, densely clothed with ashy-grey pubescence, mingled with fuscous; in the ♂ there are two or three small elongate spaces of white pubescence on the inner margin, and an indication of whitish dots in the discal and apical portion of the wing; fringes grey.

*Posterior wings* paler grey, with long grey fringes at the anal margin. (Pl. II. fig. 4, details.)

I possess two males and five females, from California, sent by Mr. Henry Edwards; the females vary very much in size and comparative robustness, the larger individuals having the legs and antennæ darker; but all seem to pertain to one species. It is a true *Notidobia*, as is the following species, and in structure is quite identical with the typical *N. ciliaris* of Europe.

*NOTIDOBIA NIGRICULA*, nov. sp. *N. nigra*. Caput thoraxque aureo-hirsuta; antennæ palpique fuscæ. Pedes flavo-fuscescentes, anteriores obscuriores. Abdomen fusco-nigrum, nigro-hirsutum: appendices inferiores magnæ, latæ, excisæ, supra in dentem incurvatum intus productæ. Alæ fuliginosæ, sparse brunneo-pubescentes: anticarum pterostigma flavum (♂).

Long. corp. 3 lin. (=  $6\frac{1}{2}$  mill.); exp. alar.  $9\frac{1}{2}$  lin. (= 20 mill.).

*Hab.* California (*in Mus. auct.*).

Dull black. *Head* and *prothorax* above clothed with golden-yellow hairs; on the face the hairs are mostly blackish; antennæ fuscous; palpi fuscous, clothed with fuscous hairs, the maxillary pair small, curved upwards, and closely applied against the face; eyes brown, somewhat coppery. *Hinder margin* of the meso- and metanota yellowish and shining. *Legs* obscure yellowish, with fuscous pubescence; all the coxæ blackish, and the anterior femora, tibiæ, and tarsi dark fuscous; spurs yellow, the pair on the anterior tibiæ fuscous.



*Abdomen* blackish fuscous, clearer beneath, clothed with black hairs : last segment above fringed with long, blackish, curved hairs : inferior appendices very large, longer than broad, yellow, concave internally, the superior margin rounded, apical margin deeply excised, superior angle produced into an incurvated tooth turned inwards, these appendices clothed externally and fringed with long blackish hairs ; penis subobtusate, the point visible below the app. inf. (Pl. II. fig. 5.)

*Anterior and posterior wings* uniformly fuliginous, subdiaphanous, clothed, but not densely, with short brownish pubescence, which becomes somewhat golden on the costal margin of the anterior wings ; and in these wings the pterostigma is indicated by a narrow yellow space ; fringes brownish-grey, becoming pale grey towards the anal angle of the posterior ; veins fuscous.

I have one male, from California, sent by Mr. Henry Edwards. It differs from *N. griseola* by the uniform smoky colour of the wings, and in the form of the appendices.

#### NOSOPUS, gen. nov.

*Calcaria* 1, 4, 4. *Antennarum articulus basalis* elongatus, hirsutus. *Palpi maxillares* parvi, ad frontem arcte applicati : *labiales* valde elongati, compresso-dilatati, squamati ; *articulo basali* parvo, 2° elongato, dilatato, 3° ad apicem acuminato. *Pedes* antici tibia brevissima calcare singulo uncinato instructa, tarsorum articulus basalis valde dilatatus, intus sulcatus, infra dense cerato-squamatus : *intermedii* posticique graciles. *Alæ* anticæ ovales, hirsutæ ; *cellula discoidali* ocellusa, angustata, *cellula thyridii* perelongata ; *cellulis septem apicalibus* : *posticæ* in medio dilatatae ; *cellula discoidali* parva, ocellusa (♂).

*Head* densely clothed with long hairs ; *antennæ* not so long as the wings, moderately stout, the apical half subserrate internally, basal joint nearly twice the length of the head, strong, hirsute, the succeeding joints short and transverse ; eyes small and round ; *maxillary palpi* very small, somewhat clavate, directed upwards and lying closely applied against the face, clothed externally with long and strong hairs ; *labial palpi* very large and long, densely clothed with scales, the basal joint short, second very long, compressed and dilated, third about as long as the second, and equally broad at the base, but gradually acuminate to the apex. *Legs* : anterior pair abnormally constructed as follows :—the coxa elongate, and ordinary ; the trochanter small and cup-shaped ; femur long, moderately slender, gradually diminishing from base to apex ; tibia very short, sub-

ovate, truncate, and dilated, slightly scaly, armed with one stout, claw-shaped spur; first joint of tarsi enormously dilated, twice the length of the tibia, sulcate internally, the lower surface densely furnished with waxy-looking scales; succeeding tarsal joints short and small, gradually diminishing in length and thickness; intermediate and posterior legs slender, and of the ordinary form, each tibia furnished with an apical and subapical pair of long and equal spurs. *Abdomen* short and somewhat stout; inferior appendices short, curved.

*Anterior wings* oval, rather densely clothed with short hairs, the fringes somewhat long; subcosta and radius nearly straight, parallel; discoidal cell narrow, closed by a straight veinlet; cellula thyridii very long, extending nearly to the base, and reaching to the middle of the discoidal cell, closed by a straight veinlet; a veinlet unites the lower fork of the ramus discoidalis with the ramus thyriifer, placed level with that closing the discoidal cell; an oblique veinlet beneath the middle of the cellula thyridii unites this with the cubitus anticus; seven apical cellules, the first extending along one-third of the upper edge of the discoidal cell, third shorter than the first, but longer than the second, fourth equal to the second, fifth longer than the first, extending to a level with the middle of the discoidal cell. *Posterior wings* moderately long, gradually dilated to beyond the middle, apex parabolic, costal margin with a short inturned fringe, anal portion with very long fringes; subcosta and radius united for some distance, afterwards separating and diverging; discoidal cell small, subtriangular, closed by a straight veinlet; a second veinlet unites the lower edge of the discoidal cell to the ramus subdiscoidalis; lower branch of the ramus discoidalis simple; ramus subdiscoidalis simply and longly furcate.

A genus abundantly distinct by the enormous labial palpi, and very abnormal structure of the anterior legs, the aborted tibia and enormous first tarsal joint in these legs being very remarkable; the mass of scales on the surface of this strange tarsal joint has, at first sight, the appearance of a waxy secretion, but resolves itself into waxy-looking scales under a high power. The genus is evidently a near ally of *Mormonia*; and nature would seem to have selected this group as one in which she can best display her wealth of forms. In this group is also exhibited a more or less constant tendency to substitute a scale-like clothing for hairs in the male sex. In the typical species of *Mormonia* (*M. hirta*) this clothing pervades almost the entire insect; in *Nosopus* it is concentrated, so to speak, upon the labial palpi and the abnormal tarsal joint. It is possible, nay, almost certain,

that the female will be found to have ordinary palpi, and the usual slender anterior legs; and, in all probability, 2, 4, 4 spurs; for one spur may be reasonably supposed to be aborted in the anterior male tibiæ.

*NOSOPUS PODAGER*, nov. sp. *N. fuscus*. Caput griseo-hirsutum.

Antennæ flavidæ, fusco-annulatæ, articulo basali supra griseo, infra nigro-hirsuto. Palpi maxillares nigro-hirsuti; labiales rufo-squamati. Pedes antici rufo-fusci, tarsorum articulo 1<sup>o</sup> infra rufo-squamato: intermedii posticique testacei. Abdomen fuscum. Alæ griseo-fuscae, subhyalinæ, griseo-hirsutæ: anticæ ad costam marginisque interioris basin breviter nigro-fimbriatæ (♂).

Long. corp. 3 lin. (= 6 mill.); exp. alar. 9 lin. (= 19 mill.).

*Hab.* California (*in Mus. auct.*).

Dark fuscous. *Head* above, and basal joint of antennæ, clothed with grey hairs; face and maxillary palpi with black hairs; antennæ (except the basal joint) yellowish, with narrow fuscous rings; labial palpi densely clothed with reddish scales. Anterior legs reddish fuscous, the lower and outer side of the first tarsal joint with dense waxy-looking reddish scales; intermediate and posterior legs testaceous, the coxæ fuscous. *Abdomen* fuscous, the margins of the segments greyish: from beneath the upper margin of the last dorsal segment proceeds a short, broad lobe, which ends in two updirected triangular pointed branches; app. inf. short, band-like, curved inwards, the apex toothed.

*Wings* greyish-fuscous, sparingly clothed with dark grey hairs: in the anterior wings the pterostigmatal region with denser hairs; apical fringes grey; costal margin, and inner margin at the base, with short blackish fringes: posterior wings with grey fringes, becoming blackish at the base of the costa: veins pale grey in all the wings. (Pl. II. fig. 6, details.)

I have one male, sent by Mr. H. Edwards.

#### DINARTHURUM, gen. nov.

*Calcaria* 2, 4, 4. Antennarum articulus basalis rectus, longissimus, corporis longitudini æqualis, irregulariter compressus, utrinque fimbriis longis, necnon ad basin spina robusta instructus; articuli cæteri breves, graciles, basalis semel sumpti longitudinem haud superantes. Palpi maxillares elongati, porrecti, plumosi, 2-articulati; articulo 1<sup>o</sup> modice robusto, 2<sup>o</sup> gracili, curvato: labiales pergraciles, elongati; articulo 1<sup>o</sup> brevissimo, 2<sup>o</sup> elongato recto, 3<sup>o</sup> 2<sup>o</sup> æquali, curvato. Pedes graciles. Alæ anticæ ovales, squamatæ hirsutæque, sulco longitudinali elongato angustato mediano instructæ; mar-

gine costali intus fimbriato, margine apicali fimbriis longis instructo; cellula discoidali occlusa, venis irregularibus (♂).

*Head* very small: eyes small and round: first joint of the antennæ extraordinarily long, equal to, or exceeding, the length of the whole body, standing out straight from the head, strong, compressed, but irregular in its breadth, arising from a prominence on the head, furnished internally at the base with a strong curved spine, which is widened and truncate at the apex, the basal portion clothed with stout hairs, afterwards fringed with two rows of very long slender hairs; the rest of the antennæ not exceeding the length of this first joint, articulated to it almost at a right angle, strongly curved, composed of numerous short and slender joints: maxillary palpi apparently 2-jointed (or there is perhaps a short, but invisible, basal joint), long, extending far beyond the head; first joint long, porrect, band-like, almost geniculate at the base, afterwards bent, strongly plumose and scaly; second joint equalling the first in length, but slender and curved: labial palpi very slender; first joint very short, scarcely visible; second joint long, cylindrical, straight; third joint equal to the second, curved. *Thorax* small. *Legs* slender, spurs 2, 4, 4, moderately long and subequal, hairy, those on the anterior tibiæ less equal and more hairy than the others; tarsal joints long and slender. *Abdomen* short; inferior appendices long.

*Anterior wings* oval, scarcely dilated, the upper half thinly clothed with scales intermingled with hairs, the lower half with hairs only: these two divisions are separated by a deep, narrow, longitudinal groove, extending from near the base almost to the apex, containing more closely placed scales; the groove is placed between the ramus thyripher (which it nearly obliterates) and the ramus clavalis, this latter being very strong and furnished with an updirected fringe of long scale-like hairs, which form a cover over the groove; subcosta and radius straight and subparallel; discoidal cell short, narrow, closed; no apparent cellula thyridii; the neuration in the lower half of the wing (below the groove) irregular, forming five large irregular cells: costal margin with a long inturned fringe in its basal half; apical margin with very long fringe. *Posterior wings* short, scarcely so broad in their widest part (which is beyond the middle) as the anterior, the apex elliptical; hairy and with a few scales on the costal margin; fringes very long: neuration regular; subcosta and radius confluent for the greater part of their length, afterwards separating and divergent, forming a long apical fork; discoidal cell very similar to that in the anterior wings, closed: lower branch of ramus discoidalis simple; ramus subdiscoidalis simply forked, connected with the ramus discoidalis by an oblique veinlet beneath the discoidal cell.

Like the last genus, allied to *Mormonia*, or perhaps more nearly



to *Lasiocephala*, with which it has some affinity in the maxillary palpi; but the extraordinary form of the antennæ is without parallel anywhere in the Trichoptera. In *Nosopus* the anterior legs were the members in the construction of which nature had departed from her usual routine; here the legs present no special characters, but every thing is thrown into the development of the antennæ, with a result which, to say the least, is bizarre. The groove or pouch of the anterior wings is not of so great significance, as modifications of this already exist in many genera, and where such a groove is present, it often, as in the present instance, causes irregularity in the neural arrangement.

The female will probably be found to have ordinary antennæ, and to resemble that of *Mormonia*.

**DINARTHURUM FEROX**, sp. nov. *D. fusco-testaceum*. Antennarum articulus basalis fuscus, fimbria grisea, ad apicem flavescens; articuli cæteri pallide flavi, fusco-cingulati. Palpi flavi, maxillares griseo-hirsuti nigroque squamati. Pedes pallide flavi. Abdomen supra fuscescens, infra ochraceum: appendices inferiores ad apicem longe dentatæ. Alæ pallide griseæ, griseo-fimbriatæ, nigroque squamatæ: anticæ margine costali basin versus sulcoque nigro-fimbriatis (♂).

Long. antenn. artic. primi  $2\frac{3}{4}$  lin. (=6 mill.); long. corp.  $2\frac{3}{4}$  lin. (=6 mill.); exp. alar. 10 lin. (=21 mill.).

*Hab.* in India septentrionali (*in Mus. auct.*).

Fuscous, or yellowish-fuscous, all the under parts of the thorax yellow.

*Head* fuscous above, yellow beneath, clothed with greyish fuscous hairs: basal joint of antennæ fuscous, becoming yellowish towards the apex, the basal portion of the tooth almost black and somewhat shining, fringes dark grey, blackish at the basal portion, and yellowish at the apical; rest of the antennæ pale yellow, with brown rings: maxillary palpi yellow, clothed with long dark grey or blackish hairs, intermingled with a few black scales; labial palpi pale yellow.

*Legs* yellow, with yellow spurs. *Abdomen* somewhat fuscous above, the margins of the segments broadly darker, under surface ochraceous: the margin of the last dorsal segment is produced into a triangular prolongation in the middle; from beneath this prolongation proceeds a yellow, shining, triangular lamina, which is deeply grooved in the centre, the sides sloping obliquely upwards, having the appearance of two valves soldered together; app. sup. yellow, short and broad, subquadrate, proceeding from beneath each side of the prolongation of the last dorsal segment; app. inf. long, yellow, directed upwards, the apex furnished with two long spines or teeth, each of which is as long as the simple basal portion, the appendices are hairy; interiorly, viewed from beneath, between the app. inf. are

seen two small yellow appendices, which are probably the app. intermed.

*Wings* pale grey, with long grey fringes. *Anterior wings* clothed with golden-grey hairs, the upper portion (above the groove) with numerous, slightly attached, black scales; these scales are absent in the lower portion; costal margin with a strong inturned fringe of blackish scale-like hairs at the base, and a fringe of similar hairs on the ramus clavalis closing over the groove; veins yellow, especially those in the lower portion, the apical ones fuscous. *Posterior wings* clothed with grey hairs, and with scattered black scales on the anterior margin; veins fuscous. (Pl. II. fig. 7, details.)

I have two males of this extraordinary creature, which were given to me by Capt. A. M. Lang, R.E., by whom they were captured in North India.

### Fam. LEPTOCERIDÆ.

#### PERISSONEURA, gen. nov.

*Calcaria* 2, 4, 4, pubescentia. Caput transversum, inter oculos excavatum; ocelli desunt: antennæ graciles, articulo basali bulboso: palpi maxillares elongati, hirsuti, articulo basali brevi, cæteris elongatis inter se longitudine fere æqualibus: labiales parvi. Thorax robustus. Pedes graciles. Abdomen robustum. Alæ amplæ, latæ, ad apicem obtusæ, pubescentes; venis robustis: anticarum radio cum sectore apicali 1<sup>o</sup> juncto, venulis transversalibus in area costali plurimis, quarum una furcata; anastomosis ante medium sita; cellula discoidali elongata, occlusa, ante apicem venula transversa insititia instructa; cellulis apicalibus decem, elongatis: posticæ anticis haud latiores (♀).

*Head* transverse, polished, excavated between the antennæ; no ocelli; eyes moderately prominent; antennæ not longer(?) than the wings, slender, the basal joint bulbous; maxillary palpi long, hairy, ascending, basal joint very short, second and third joints long, equal, cylindrical, stout, fourth and fifth slightly shorter and thinner, the latter obtuse at the apex; labial palpi small, hairy, first joint very short, second and third longer, equal. *Prothorax* small and transverse, hairy. *Mesothorax* robust, convex above, polished. *Legs* slender, pubescent; spurs 2, 4, 4, pubescent; anterior tibiæ with a pair of moderately long and subequal spurs; intermediate and posterior tibiæ each with two pairs of long and subequal spurs. *Abdomen* very stout, long; the apex beneath forms a polished, flattened surface, on which is seen an oval scale on each side of the vulva, and beyond these two acute valves.

*Wings* broad, clothed with moderately dense, short pubescence; the veins very strong and much elevated. *Anterior wings* much dilated at the apex, which is obtuse, the apical margin obliquely rounded, the inner margin very concave; subcosta straight, running into the costal margin; radius parallel with the subcosta, running into the first apical sector near the apex, joined to the subcosta by a short transverse veinlet; costal area with the usual basal veinlet, followed by a broadly furcate veinlet, and after this by 4-5 oblique veinlets, all strong and well marked; first apical sector near its base joined to the radius by a veinlet; discoidal cell long, its apical quarter narrowed after the points of departure of the first apical sector, a transverse veinlet at about the point of departure of this sector, and another beyond, at the point of furcation of the lower branch of the ramus discoidalis; cellula thyridii very long, extending nearly to the base, gradually dilated to the point where it is closed by a transverse veinlet; anastomosis complete, situated before the middle of the wing; apical cells ten in number, very long, the fifth and seventh not reaching the anastomosis, and acute at the base. *Posterior wings* scarcely so broad as the apical portion of the anterior, obtuse, the apical and inner margins gently rounded, costal margin folded narrowly inwards for the greater part of its length; subcosta and radius separated only at the base and apex; discoidal cell shorter than in the anterior, similarly formed, but without the supplementary inner veinlet; forks one, two, three, and five all present; costulae numerous; cubitus furnished with a fringe of strong oblique hairs, which lie close to the membrane beneath it: marginal fringes scarcely present in either pair of wings (♀).

In no other genus am I aware of the existence of the numerous strong costal veinlets here present. It is true that the species of the anomalous family *Æstropsidæ* (*Polymorphanisus* &c.) present an analogous character; but in them these veinlets are ill-developed, and have been aptly termed by Brauer, the founder of the family, "false veinlets." Neither am I aware of the existence of a supplementary veinlet in the discoidal cell in other genera. Although I place the genus in the *Leptoceridæ*, I am by no means sure of its position, which can only be decided by the discovery of the male. In fact, several points of structure rather indicate that its true location would be in the *Sericostomatidæ*, in the vicinity of *Barypenthus* and *Musarna*. The form of the maxillary palpi of the female is not inconsistent with its position in either *Leptoceridæ* or *Sericostomatidæ*.

*PERISSONEURA PARADOXA*, n. sp. *P. atra*, capite thoraceque nitidis. Pedes picei, genibus calcaribusque testaceis. Abdomen sor-

dide nigrum; linea utrinque laterali ochracea; segmentis apicalibus ventralibus flavo-marginatis. Alæ fuscae, subnitidæ, nigro-pubescentes; venis piceis (♀).

Long. corp.  $7\frac{1}{2}$  lin. (= 15 mill.); exp. alar. 22 lin. (= 46 mill.).

*Hab.* Japonia (in Mus. Dom. De Selys).

*Head and thorax* deep shining black; eyes greyish; antennæ blackish; palpi yellowish, clothed with blackish hairs; prothorax above clothed with black hairs, beneath forming a pale yellow space extending between the anterior coxæ, and on each side of these. *Legs* pitchy, the anterior pair paler, somewhat testaceous; the knees and spurs testaceous. *Abdomen* dull black, an ochreous line along each side, and the margins of the terminal ventral segments yellow; terminal portion beneath flattened, smooth and yellow: vulvar scales large, oval, piceous, lying closely applied to the surface; beyond these are two acute triangular yellow valves, the tips blackish and extending somewhat beyond the apex of the abdomen.

*Wings* uniformly fuscous, somewhat shining, clothed with blackish pubescence, which is more dense on the posterior wings and on the costal portion of the anterior; in the anterior pair, beyond the anastomosis, is an appearance of an indistinct whitish discal space; the veins all piceous. (Pl. II. fig. 8, details.)

For the opportunity of examining and describing this curious insect I am indebted to the courtesy of my friend the Baron de Selys Longchamps, the learned monographer of the *Odonata*.

*ASCALAPHOMERUS*, *Walk.* (Cat. Brit. Neurop. pt. 1, p. 79).

*Calcaria* 2, 4, 4. *Caput*: ♂ oculi permagni, supra fere connexi; ♀ oculi parvi, distantes; vertex transversus, cirris instructus: ocelli desunt: palpi maxillares tæniiformes, valde hirsuti, articulo basali brevi, 3° valde elongato, 2°, 4°, et 5° brevioribus; labiales parvi, graciles: antennæ valde elongati, in ♀ breviores, cylindrici, graciles, vel interdum in ♂ gradatim crassiores, articulo basali brevi. *Corpus* robustum, breve. *Pedes* graciles. Alæ fere nudæ: anticæ elongatæ, apicem versus dilatatæ, margine apicali obliquo; venæ robustæ, radio cum sectore primo paullo ante apicem conjuncto (et in al. post); cellula discoidali brevi, oclusa; cellula thyridii permagna, ante alæ medium sita; cellulis apicalibus elongatis, angustatis: posticæ elongato-ovales, anticis fere dimidio breviores.

*Head* of the ♂ occupied almost entirely by the eyes, which are very large, and nearly confluent above: that of the ♀ with the eyes small; the vertex transverse, furnished with large tubercles, whence



arise tufts of long hairs: ocelli absent: antennæ very long and slender, but sometimes gradually thickening to the apex; basal joint short, succeeding joints (after the second) long, but those of the apex becoming gradually shorter and almost transverse: maxillary palpi ascending, the joints band-shaped and very hairy; first joint short, third very long, second, fourth, and fifth each shorter than the third, but the second longer than the fourth or fifth: labial palpi very small and slender, the two end joints elongate. *Mesothorax* very robust, long-oval, nude, but with a tubercle near the point of connexion of each anterior wing, whence arise long hairs similar to those on the vertex. *Abdomen* short, very robust in the ♀. *Legs* slender, pilose; spurs 2, 4, 4, the pairs subequal.

*Wings* nearly nude and shining, the veins very conspicuous and strong, alike in both sexes. *Anterior wings* elongate, dilated towards the apex, which is considerably produced; apical margin very oblique; inner margin concave; radius becoming confluent with the first apical sector a little before the apex, but sending a short branch to the costal margin; discoidal cell closed, short, elongately triangular, no veinlet between this cell and the radius; cellula mediana longer than the discoidal, equal to it at its extremity, but extending further inwards at its base; cellula thyridii very broad, commencing near the base, but not extending to the middle of the wing (ending before the commencement of the discoidal cell), hence the sixth to ninth apical cells extend far into the wing; all the apical cells narrow and very long. *Posterior wings* elongately oval, much shorter than the anterior wings, and scarcely broader: radius confluent with the first sector, as in the anterior, and the subcosta also appears to be confluent with the radius at its apex; the cubitus is furnished with a fringe of long hairs towards the base, and the veins of the anal angle are similarly fringed.

The appendices of the male are complicated: the app. sup. rather long, narrow at the base, but gradually dilating into a spoon-shaped club; the app. inf. two-jointed, the apical joint being short and ovate; between the app. sup. are two large blades, nearly uniting in the middle, but with the obtuse points divergent; and between and below these there is the penis, only the apex of which is visible. In the female the extremity of the abdomen is broad, forming a large open pouch with two broad side valves and a median prolongation of the last dorsal segment; the apical ventral segments are narrow and transverse.

The figures on Pl. III. (fig. 9) are taken from *A. finitimus*, M'Lachlan. The original species, *A. humeralis*, Walker, is larger and darker, and, with the appendices somewhat different, though



formed after the same plan. In both, the antennæ of the female are much shorter than those of the male, in *humeralis* remarkably so. In *fnitimus* these organs are slender throughout in the ♂, whereas in *humeralis* they are gradually incrassate in the apical portion.

A completely analogous formation of the eyes in both male and female is to be found in the micro-lepidopterous genus *Adela*.

I have diagnosed and described this extraordinary genus anew, because the description given by Mr. Walker is insufficient. It appears to me that, having regard to the homologies of the arrangement of the nervures in Trichoptera, an error has been frequently committed, of which I have myself been guilty in some previous descriptions in former papers. I allude especially to the area or cell which has been called the "cellula thyridii" in the anterior wing. To Kolenati we are indebted for a very lucid explanation of the different veins, areas, and cellules; and in his index wing (Gen. et sp. Trichop. pt. 1, tab. i. f. 1), taken from *Glyphotalius*, the "cellula thyridii" is the area between the two veins which he terms "radii ramus thyriifer," and "radii ramus clavalis," and which I have called (Trichop. Britannica) the "superior and inferior branches of the ramus thyriifer." But in almost all genera of Hydropsychidæ, and in several genera of Leptoceridæ, e. g. *Ascalaphomerus*, *Anisocentropus*, *Ganonema*, *Asotocerus*, *Calamoceras*, *Heteroplectron*, &c., the superior branch of the ramus thyriifer ("radii ramus thyriifer" of Kolenati) furcates near the middle of the wing; and this furcation is generally closed by a transverse veinlet placed nearly on a level with that closing the discoidal cell, and forming a cellule, which has been usually termed the "cellula thyridii," though the true cellula that should be so called, equivalent to that in the Limnophilidæ, &c., lies beneath it, extending to near the base, and usually ending soon after the commencement of the cellule formed by the connected ramules of the superior branch. This latter cellule, then, I propose to call the "cellula mediana." A reference to the outline figures of the wings of any of the above-named genera will more fully explain my meaning.

In Mr. Walker's description of the genus *Ascalaphomerus* the words "cell of the thyridium" should then read "median cellule;" and his "interclaval areolet" is in reality the true "cellula thyridii."

*HETEROPLECTRON*, gen. nov.

*Calcaria* 2, 4, 2, ♂; 2, 4, 4, ♀. *Maris tibie posticæ fimbriis*

longis extus instructæ. Antennæ alis paullo longiores, intus subserratæ. Palpi maxillares longati; articulo 1<sup>o</sup> brevi, 2<sup>o</sup> et 3<sup>o</sup> elongatis, 4<sup>o</sup> et 5<sup>o</sup> brevioribus. Alæ anticæ amplæ, elongato-triangulares: pube brevi dense vestitæ; margine apicali obliquo; venis ♂ ♀ æqualibus; cellula discoidali oclusa, elongata, angustata; cellulis apicalibus novem angustatis, quarum 1<sup>a</sup> ad basin cellulæ discoidalis fere extensa: posticæ breves, latæ; radio cum sectore primo ad apicem conjuncto (♂ ♀).

*Head.* Antennæ stout, tapering to the apex, rather longer than the wings; the basal joint short, subglobose; third and succeeding joints long (the third longer than the others); each, at its apex internally, carries one or two short spines or bristles, causing the antennæ to appear somewhat serrated, but these are absent in the extreme apical portion. Eyes small. Maxillary palpi long, stout, hairy: basal joint short; second very long; third slightly shorter than the second, and thinner; fourth and fifth each about one-third shorter than the third. Labial palpi small: basal joint very short; second long, third still longer than the second. *Prothorax* very small; on each side beneath is a semicircular lobe. *Mesothorax* oval, elongate. *Metathorax* cordate. *Abdomen* short, moderately stout; ♂ superior and inferior appendices present; penis (or upper penis-cover?) long, triangular; ♀, apex of abdomen oblique, forming a shallow cavity beneath. *Legs*: anterior pair short; intermediate and posterior very long; posterior tibiæ of the ♂ fringed externally with very long silky hairs; tarsal joints long; in the ♂ the first two joints have, externally, long bristle-like hairs, which, becoming agglutinated, have the appearance of long spines. Spurs: ♂, 2, 4, 2, the pairs subequal, those on the anterior tibiæ shorter; ♀, 2, 4, 4.

*Wings.* *Anterior wings* ample, elongately triangular, the apical margin oblique; densely clothed with short pubescence; fringes very short: subcosta and radius regular, straight, connected towards the apex by a transverse veinlet; discoidal cell very long and narrow, closed; median cell longer than the discoidal, and broader; cellula thyridii commencing near the base and extending to the middle of the median cell; nine apical cellules, all of which are long, the first extending to two-thirds the length of the discoidal cell, first, third, fifth, seventh, and ninth acute at the base, second, fourth, sixth, and eighth truncate. *Posterior wings* short and broad, the costal margin rounded up to near the apex, the apical portion being slightly excised; apex obtuse; radius becoming confluent with the first apical sector before the apex; neuration otherwise much as in the anterior wings, allowing for the usual differences; the discoidal cell is perhaps open in these wings (the possible position of a trans-

verse veinlet closing it, is marked in the figure by a dotted line; but I could not clearly determine it).

It is an almost invariable rule in Trichoptera that the number of spurs on the posterior tibiæ shall equal, or exceed, that of the intermediate. However, in 1863 (Trans. Ent. Soc. Lond. 3rd series, vol. i. p. 492) I described a genus (*Anisocentropus*) in which the spur-formula was 2, 4, 3, in both sexes, and another (*Nesopsyche*) in 1866 (*l. c.* vol. v. p. 268), with the formula 3, 4, 3. And in *Heteroplectron* we have a still more remarkable case, the formula being 2, 4, 2 for the ♂, though regular (2, 4, 4) for the ♀. The genus is probably allied to *Anisocentropus*, somewhat resembling its general form, but differing (besides in the spurs) by the shorter, stouter, and subserrate antennæ, different proportions of the joints of the palpi, minor characters of neuriation, and the long-fringed posterior tibiæ of the ♂. But it has little affinity with any other described genus of Leptoceridæ.

**HETEROPECTRON CALIFORNICUM**, nov. sp. *H. fusco-nigrum*. Caput thoraxque aureo-hirsuta. Antennæ fuscae. Pedes flavi; maris tibiæ posticæ extus fimbriis aureo-griseis longis instructæ. Alæ anticæ fusæ, aureo-pubescentes; venis venulisque fusco-nigris: posticæ fusco-nigræ (♂ ♀).

Long. corp.  $4\frac{1}{2}$ – $5\frac{1}{2}$  lin. (=11–12 $\frac{1}{2}$  mill.); exp. alar. 14–16 lin. (=29–34 mill.).

*Hab.* California (*in Mus. auct.*).

Blackish fuscous. *Head* clothed with golden hairs, springing from tubercles on the crown; thus there is a rounded tubercle on each side close to the eyes, another in front between the basal joints of the antennæ (these simulate ocelli), and an elongate one on each side on the posterior margin (when the hairs are removed, these tubercles are seen to be paler brown than the ground-colour): antennæ fuscous or black, somewhat yellowish in some ♂ individuals, with obsolete darker annulations; eyes dark coppery; palpi clothed with fuscous hairs. *Prothorax* clothed with golden hairs; and there is a broad line of similarly coloured hairs down the middle of the *mesothorax*. *Legs* testaceous, darker in the ♀; in the ♂ the outer side of the tibiæ is fringed with very long greyish-golden, silky hairs, and the tarsal joints have long spine-like tufts of greyish or fuscous hairs. *Abdomen* blackish; appendices of the ♂ somewhat testaceous; app. sup. elongately triangular, pointed, arising from each side of the middle of the margin of the last dorsal segment, fringed with long golden hairs; app. inf. thick, cylindrical, curved upwards, fuscous at the base, then testaceous, and black at the tips, fringed with long golden hairs; from the interior of the cavity of the last segment

arises the long, triangular, yellow penis (or perhaps it is rather only the penis-cover), the apex of which is somewhat produced and notched, this member is concave beneath, and extends beyond the appendices.

*Anterior wings* varying from dark golden brown to blackish fuscous, uniformly of one tint without markings (the ♀ always the darker), clothed with golden or fuscous pubescence (when the pubescence is removed, the membrane appears to be sprinkled with somewhat numerous, but indistinct, pale dots); fringes fuscous; veins brown, costa, subcosta, and radius darker, because thicker; upper branch of the ramus thyriifer, in that portion of it that forms the upper boundary of the cellula thyridii, whitish, semitransparent. *Posterior wings* smoky blackish, the veins darker; fringes blackish. (Pl. III. fig. 10, details.)

I have examined six males and two females, sent to me by Mr. Henry Edwards, of San Francisco.

GANONEMA, *M'Lachlan* (Tr. Ent. Soc. Lond. ser. 3, vol. v. p. 253).

In this genus should be placed *Hydropsycha vicaria*, Walker, Cat. Brit. Mus. Neurop, pt. 1, p. 114, from Venezuela, the type of which is a single unexpanded example with broken antennæ. I have received a second individual from the same quarter, from which I have drawn up the following description. A second species is also from Venezuela. These do not differ sufficiently in structure from the Malayan *G. pallicorne* to necessitate the formation of a genus for their reception, notwithstanding the wide difference in locality. I still think that the suspicion expressed by me (*l. c.* p. 255), that *Asotocerus* and *Ganonema* may be identical, is well-founded, especially as the neural differences in the fore wings are more apparent than real, inasmuch as the lower branch of the ramus discoidalis is really only simply furcate in *G. pallicorne*, the supposed additional sector belonging to the ramus thyriifer; hence there are the same number of sectors in both genera. The neuration of the hind wings of both the Venezuelan species is like that in *Asotocerus*, both being males; thus it is very probable that the differences are sexual, as I suspected. In the form of the wings the South-American species agree with *Ganonema* \*.

\* A very closely allied genus is *Calamocerus*, Brauer, as would seem to have been since recognized by its describer (Verh. Zool. Bot. Gesell. Wien, 1868, p. 406). I cannot help thinking that the locality, "Gibraltar," given for *C. marsupus*, has arisen from an error in labelling, and that the insect is really exotic.



**GANONEMA VICARIUM.** (*Hydropsyche vicaria*, *Walk. l. c.*) *G. ferrugineum*, mesothoracis lateribus nigricantibus. Antennæ flavæ, nigro-annulatæ, articulis singulatim spina brevi iutus ad apicem instructis. Pedes flavi, tibiis tarsisque intermediis extus obscurioribus. Alæ anticæ griseo-fulvæ, nigro-pubescentes et fimbriatæ, maculis aureis plurimis indistincte irroratæ; margine apicali obliquo, paullo rotundato; cellula apicali 1<sup>a</sup> anastomosim attingente: posticæ griseo-subhyalinæ, griseo-fimbriatæ (♂).

Long. corp. 4 lin. (=9 mill.); long. antenn. 15 lin.(=32 mill.); exp. alar. 12-13 lin. (=25-27 mill.).

*Hab.* Venezuela (*Dyson; Göring; in Mus. Brit. et auct.*).

Ferruginous (or reddish-testaceous). *Head* clothed with scattered yellowish hairs upon the vertex, and with a few distant black hairs at the margins of the orbits: antennæ yellow; each joint, after the basal, conspicuously black in its apical half, the apex of each bearing a short black spine internally (in the last third the annulations become indistinct and brownish, and finally disappear): eyes coppery: maxillary palpi yellow, clothed with long black hairs, intermingled with some yellowish ones: labial palpi with yellow hairs. *Mesonotum* bearing a broad black stripe along each side. *Legs* yellow, with yellow pubescence; but the intermediate tibiæ and tarsi are rendered blackish externally owing to the presence of sparse blackish pubescence. *Abdomen* yellowish, the apex obscure: app. sup. long, flattened, somewhat lanceolate, yellowish, the points approximating; app. inf. long, thinner than the app. sup., directed upward, with a tuft of blackish hairs at the tips; between the app. inf. is seen the short, thick, yellow penis (or cover?). (Pl. III. fig. 11.)

*Anterior wings* obliquely rounded at the apical margin; grey or greyish-fulvous, densely clothed with blackish pubescence, especially at the apical portion, and with numerous but ill-defined spots formed by golden-yellow pubescence; apical fringe short, blackish, golden at the extreme base; first apical cellule reaching the anastomosis, as long as the third, impinging only slightly upon the discoidal cell. *Posterior wings* pale grey, subhyaline, iridescent; fringes grey; veins brownish.

The pubescence of the anterior wings is only lightly attached; the golden markings are more conspicuous when the wings are closed.

**GANONEMA MOLLICULUM**, n. sp. *G. flavo-testaceum*. Antennæ flavæ, brunneo-annulatæ. Pedes flavi. Alæ anticæ subhyalinæ, aureo-pubescentes, brunnescenti-fimbriatæ; margine apicali oblique truncato; cellula apicali 1<sup>a</sup> petiolata: posticæ albido-subhyalinæ, albido-fimbriatæ (♂).



Long. corp.  $3\frac{1}{4}$  lin. (=7 mill.); long. antenn. 16 lin. (=34 mill.); exp. alar. 12 lin. (=25 mill.).

*Hab.* Venezuela (Göring), in *Mus. auct.*

Testaceous yellow. *Head* and palpi clothed with yellowish hairs; antennæ pale yellow, the apical half of each joint pale brownish, not toothed internally. *Legs* yellow, with yellow pubescence. *Abdomen* pale yellow: app. sup. flat, lanceolate, pale yellow, with long concolorous fringes; app. inf. two-jointed, yellow, the first joint somewhat swollen, the second ovate, shorter, turned slightly inwards, the extreme tip reddish-testaceous; between and beneath the app. inf. is the short broad penis (or cover?), which is deeply concave beneath and blackish internally, the margin thickened. (Pl. III. fig. 12.)

*Anterior wings* subhyaline, clothed with golden pubescence, which is thin in the basal portion, but becomes denser and slightly brownish in the apical; apical fringe pale brown; apical margin obliquely truncate; veins very pale yellowish; first apical cellule not reaching the anastomosis, petiolate and acute. *Posterior wings* whitish, subhyaline, the pubescence with a slight yellowish tinge; fringes very pale yellowish or whitish; veins pale.

#### Note on Genus PSEUDONEMA, *M'Lachlan*.

With a view to testing the value of Brauer's suspicions ('Reise der Novara,' Neuropteren, p. 14) that *P. obsoletum*, described by me in 1862, might probably be the same as *Tetracentron sarothropus*, Brauer, I have lately made a reexamination of the type in Mr. Dale's collection. There can be no doubt of the identity of my species with that of Brauer, the generic description of *Pseudonema* being faulty, in consequence of the type having been mutilated. This is one of those cases in which the older name may very justly be forced to give way to a later one: henceforward I consider *P. obsoletum* merely a synonym of *T. sarothropus*. Priority in nomenclature should, no doubt, be a rule absolute, as the only means of avoiding constant alterations depending upon what is a "correct description," as defined by individual caprice; but, as there is no rule without an exception, I think that when an author, as in my case, willingly discards a name given by him, succeeding writers should accede to his expressed wishes.

SETODES, *Rambur*.

SETODES ARGENTIFERA, nov. sp. *S.* pallide lutea. Antennæ albidæ, late fulvo cinctæ. Pedes luteo-albidi; tibiis anticis muticis. Alæ anticæ pallide fulvo-luteæ, angustatæ, seriebus punctorum argenteorum circa sex longitudinalibus ornata; anastomosi obliqua, cellulis apicalibus septem: posticæ albo-hyalinæ, albo-fimbriatæ (♂).

Long. corp.  $2\frac{3}{4}$  lin. ( $=5\frac{1}{2}$  mill.); exp. alar. 7 lin. ( $=15$  mill.).

*Hab.* India septentrionalis (in *Mus. auct.*).

Whitish-yellow, ochreous beneath. *Head*: antennæ whitish, the joints long, the apical half of each joint fulvous, basal joint bulbous, wholly yellowish; palpi whitish-yellow, clothed with concolorous hairs; eyes large, black, somewhat brassy. *Legs* pale yellowish or whitish; anterior tibiæ with no spur; intermediate and posterior each with a pair of moderately long apical spurs. *Abdomen* yellow, somewhat reddish; an elongate, obtuse lobe proceeds from the upper margin of the last dorsal segment; from beneath this lobe proceed two slender spines (app. intermed.), applied closely one against the other, and curved strongly downwards; app. inf. slender, obtuse, finger-shaped, curved strongly upwards, originating from a broad, subtriangular, lateral basal piece.

*Anterior wings* narrow, obtuse, pale fulvous, with about six longitudinal rows of small silvery-white points, one row in the area between each of the principal longitudinal veins; fringes golden yellow; veins pale; discoidal cell elongate; anastomosis oblique, and somewhat irregular (see figure); ramus clavalis simple; hence there are seven apical cells. *Posterior wings* whitish, subhyaline, with white fringes. (Pl. III. fig. 13, details.)

I have examined four males of this delicate species, taken by Mr. C. Horne in North-west India. It is closely allied to the European *S. hiera*, Kolenati, which also has unarmed anterior tibiæ, and silvery spots on the wings; but these spots are larger in *argentifera*.

## Fam. HYDROPSYCHIDÆ.

MACRONEMA, *Pictet*.

MACRONEMA POLYGRAMMATUM, nov. sp. *M.* fuscum. Caput fuscum; fronte, palpis, occipitis tuberculisque flavis; antennæ fuscæ, basin versus flavæ, tenuiter fusco annulatæ. Pedes pallide flavi, trochanteribus nigro-punctatis. Abdomen flavo-ochraceum. Alæ anticæ angustatæ, stramineo-flavæ, nitidæ; strigulis transversalibus plurimis, fasciis duabus, divaricatis, obliquis, ad costam confluentibus, apiceque pallide fuscis; venis flavis; posticæ albo-hyalinæ, apice pallide griseo (♂).

Long. antenn. 16 lin. (=34 mill.); long. corp.  $3\frac{1}{2}$  lin. (=8 mill.); exp. alar.  $13\frac{1}{2}$  lin. (=28 mill.).

*Hab.* America borealis (in *Mus. auct.*).

Fuscous. *Head*: occiput with two very large, oval (or somewhat reniform) yellow tubercles on the disk, on each side, and two more elongate ones posteriorly, each of these latter extending below the eye, these tubercles clothed with short yellow hairs; face and palpi yellow, or yellowish ochreous; antennæ very long and slender, the basal joint ochreous, somewhat fuscous, the succeeding ten or twelve joints yellow, each with a very narrow fuscous ring at its apex, the rest fuscous, gradually shading off from the yellow of the basal joints. *Thorax* fuscous, hairless; the metanotum with a depressed space in the middle, which is somewhat yellowish. *Legs* pale yellow, a black dot on each of the trochanters, and the apex of the tibiæ, and the apical joint of the tarsi also with a black point; anterior tibiæ with two short and subequal apical spurs; intermediate and posterior tibiæ each with two pairs of long and unequal yellow spurs. *Abdomen* ochreous, somewhat fuscous, margin of the terminal joint with a fringe of long yellow hairs: inferior appendices very long and slender, yellow and cylindrical, approximate at the apex, two-jointed, the apical joint curved upwards; penis short, roundly capitate at its apex.

*Anterior wings* long and narrow, gradually dilated to before the apex, which is subelliptical, nearly nude, and shining, pale straw-yellow, with numerous pale fuscous markings, as follows:—rather beyond the middle are two fasciæ commencing together on the costa, but then running obliquely into the inner margin in different directions, leaving a broad triangular space between them, in which is a line and one or two points; the apex broadly fuscous, ending in a narrow transverse curved line of the pale ground-colour; the basal portion of the wing before the first fascia is occupied by numerous short transverse streaks and points, and then several similar streaks between the second fascia and the apical portion; pterostigma indicated by a subopaque space clothed with short yellow pubescence; veins pale yellow. *Posterior wings* whitish hyaline, the costa abruptly excised before the apex; extreme apex rather broadly margined with pale grey; veins greyish-white, more obscure at the apex; fringe of the anal margin whitish. (Pl. III. fig. 14.)

I possess about nine male examples, sent to me by Mr. Ridings, of Philadelphia, with other North-American insects, but without any special indication of locality. Possibly the nearest ally of the species is the Brazilian *M. maculatum* of Perty (Delect. Anim.). It is a strikingly elegant form.

**MACRONEMA DIGRAMMA**, nov. sp. *M. nigrum*, fronte ochracea. Antennæ nigræ. Pedes flavi; tibiis anticis fere muticis, extus fusco signatis. Abdomen nigrum; appendicibus inferioribus gracilibus, nigris; pene pyriformi, flavo. Alæ anticæ angustæ, ad apicem obtusæ, margine costali interioreque subparallelis, nigro-infuscatæ, pubescentes; fasciis duabus transversalibus, marginem interiorem haud attingentibus, albis: posticæ pallidiores, cupreo- et orichalceo-micantes (♂). Long. antenn. 15 lin. (=32 mill.); long. corp.  $3\frac{3}{4}$  lin. (=8 mill.); exp. alar. 12 lin. (=25 mill.).

*Hab.* Minas Geraes, Brasilia (*in Mus. auct.*).

Black, almost hairless. *Head*: front swollen, ochraceous; occiput with two very large rounded swellings, whence spring short blackish hairs; antennæ very long and slender, black; palpi ochraceous; eyes brown. *Thorax* black. *Legs* yellow or testaceous, anterior tibiæ with indistinct fuscous markings externally; the spurs on these tibiæ very minute, almost obsolete; spurs on the other tibiæ long, yellow. *Abdomen* black, margins of the segments greyish; last segment above fringed with long black hairs; app. sup. obsolete; app. inf. very long and slender, two-jointed, the apical joint curved strongly inwards, fringed with black hairs; penis yellow, pyriform, the apex very obtuse; penis-cover broad, semitransparent, obtuse.

*Anterior wings* long and narrow, the costal and inner margins nearly parallel, the apex subelliptical, smoky fuscous, with rather dense, but very short, darker pubescence; two narrow, white, transverse parallel fasciæ, neither of which reaches the inner margin, but both starting from the costa, one placed rather before the middle of the wing, the other at about two-thirds of the length from the base, this latter being broadest on the costal margin; veins scarcely darker. *Posterior wings* somewhat paler, semitransparent, with beautiful coppery and brassy reflections; the costal margin deeply excised before the apex, and in the excision is an appearance of a whitish mark; fringes very short and blackish; veins darker. (Pl. III. fig. 15.)

I have one ♂ from Minas Geraes, collected by Mr. Rogers. The species is remarkable for its narrow wings, which are scarcely dilated before the subelliptical apex. The anterior tibiæ are almost spineless; but this obtains in other species of the genus as it is now constituted.

#### *HYDROPSYCHE, Pictet.*

**HYDROPSYCHE COLONICA**, nov. sp. *H. fusco-nigra*. Caput cano-hirsutum: antennæ fusæ, vix pallido annulatæ. Pedes flavescentes. Abdomen fusco-nigrum, linea utrinque albida; ♂ segmento terminali supra in lobum elevatum medianum incisum producto; appendices testacæ; inferiorum articulo ultimo brevi, subobtusos, ro-



busto; penis cylindricus, paullo sursum incurvatus; apice incrassato, bifido, infra uncis duobus latis, incurvatis, acutis instructo. Alæ anticæ angustatæ, elongatæ, flavescentes, dense saturate griseo reticulatæ; striis brevibus, ad marginem inferiorem, fusco-nigris: posticæ fuliginosæ, venis saturatioribus (♂, ♀).

Long. corp. ♂ 3 lin. (=7 mill.), ♀  $3\frac{1}{2}$  lin. (=7 $\frac{1}{2}$  mill.); exp. alar. ♂  $10\frac{1}{2}$  lin. (=22 mill.), ♀  $13\frac{1}{2}$  lin. (=28 mill.).

Hab. Nova Zealandia (Christchurch, Canterbury, *Fereday*) (in *Mus. auct.*).

Blackish. *Head* and *prothorax* densely clothed with hoary hairs; antennæ fuscous, with indistinct paler annulations, and with the oblique blackish streak on each joint of the basal portion usual in species of this genus. *Mesothorax*, *metathorax*, and *abdomen* black or blackish, the latter with a broad whitish line along each side, most conspicuous in the ♀. *Palpi* and *legs* testaceous or yellowish. In the ♂ the terminal dorsal abdominal segment bears in its middle a nearly vertical short lobe, which is emarginate or notched: appendices testaceous or yellowish; from under the last dorsal segment proceeds a shining, semitransparent yellowish lobe, which is deeply excavated in its middle above, the sides deflexed, and the apex angular; app. sup. apparently wanting; app. inf. long, cylindrical, directed upwards, and forcipate, the second joint being short, thick, and subobtuse, clothed with short golden pubescence, and with two or three longer blackish hairs; penis cylindrical, directed upward, gradually becoming thinner to the glans, which is dark reddish testaceous and deeply bifid, bearing beneath two broad, claw-shaped, acute teeth or hooks, which curve upward. In the ♀ the apex of the last dorsal segment is bifid, and from beneath it proceeds an elongato-quadrate testaceous lobe, from each side of which springs a long hair; sides oblique, with a broad obtuse valve on either side. (Pl. IV. fig. 16.)

*Anterior wings* long and narrow (broader in the ♀), greyish yellow, thickly reticulated with dark grey, and with several short, almost blackish, streaks on the inner margin, which alternate with yellowish spaces (the grey reticulation and spots are caused by the colour of the pubescence). *Posterior wings* wings clothed with rather dense smoky pubescence, subhyaline; the veins darker.

This species probably represents No. 14 (from Auckland) in my 'Catalogue of New Zealand *Trichoptera*,' published in the Journ. Linn. Soc. Zool. vol. x. p. 213, and of which I had then only seen one much damaged example. I have since received both sexes, in good condition, from my old friend Mr. Fereday.

It is a very ordinary-looking insect, of a type common to many European and American species, but should be easily recognized by the form of the penis; and, in fact, this organ seems to present the only safe characters whereby to separate many of the species of this perplexing and widely distributed genus.



**HYDROPSYCHE MAURITIANA**, nov. sp. *H. testacea*. Caput dense aureo-hirsutum: antennæ pallide flavo-testaceæ, brunneo annulatæ: palpi pedesque flavo-testacei. Abdomen fusco-nigrum, utrinque griseo lineatum; appendices testaceæ; app. inf. elongatis, cylindricis, sursum directis, articulo secundo brevi; penis brevis, incrassatus, latus, ad apicem angulato-bifidus, infra ante apicem processu elongato, gracili, capitato, bidentato instructus. Alæ anticæ elongatæ, rufo-testaceæ, obsolete griseo reticulatæ: posticæ subhyalinæ, sparse breviterque griseo-pubescentes; venis testaceis (♂).

Long. corp.  $4\frac{1}{2}$  lin. (=  $9\frac{1}{2}$  mill.); exp. alar.  $13\frac{1}{2}$  lin. (= 28 mill.).

*Hab.* Insula Mauritius, mense Julio (in *Mus. auct.*).

*Testaceous.* *Head* and *prothorax* densely clothed with pale golden-yellow hairs: antennæ pale yellowish testaceous, with brown annulations. *Palpi* and *legs* yellowish testaceous, a black dot on the inner side of each of the trochanters, and the extreme tip of each tibia externally blackish. *Abdomen* blackish fuscous, with sparse grey hairs, and with a grey line along each side: appendices testaceous: a broad obtuse lobe is connected to the middle of the last dorsal segment, and from beneath this arises a membranous lobe, which is excised to the base above, the sides being produced into forcipate elongations: app. inf. long, arising from a broad basal piece which is strongly fringed; cylindrical, with long testaceous hairs; the second joint curved inward and downward and forcipate: penis short, broad, and thick, the glans much dilated and deeply emarginate, the lobes being somewhat angular; from the base of the glans beneath arises a long, slender, cylindrical process, which extends beyond the apex, and the tip of which is abruptly rounded, bearing above two straight, slightly divergent teeth. (Pl. IV. fig. 17.)

*Anterior wings* elongate, reddish testaceous, with obscure grey reticulations, which are most evident in the apical portion and near the base; apical fringe very short, blackish; veins pale testaceous. *Posterior wings* subhyaline, faintly tinged with yellowish, and sparsely clothed with short grey pubescence; veins pale testaceous.

I possess one ♂ indicated as having been taken in the Island of Mauritius in July. It is in bad condition; but the species is so distinct in coloration and in the structure of the penis that I have not hesitated to describe it; I know no species in which the penis shows any approach to an analogous formation.

**HYDROPSYCHE MODICA**, nov. sp. *H. fusca*. Caput, prothorax mesothoraxque supra in medio, griseo-aureo-hirsuta: antennæ testaceæ, brunneo-annulatæ: palpi pedesque flavo-testacei. Abdomen fusconigrum: appendices testaceæ; app. inf. articulo secundo gracili, spiniformi: penis gracilis, ad apicem elongato-capitatus, inermis. Alæ

anticæ angustatæ, pallide flavidescentes, haud signatæ: posticæ grisescentes, subhyalinæ (♂).

Long. corp.  $2\frac{1}{2}$  lin. ( $=5\frac{3}{4}$  mill.); exp. alar.  $9\frac{1}{2}$  lin. ( $=20$  mill.).

Hab. Australia (Victoria, *Edwards*) (in *Mus. auct.*).

Fuscous. *Head*, *prothorax*, and two impressed lines on the *mesonotum* densely clothed with golden-grey hairs: antennæ testaceous, annulated with brown: palpi testaceous. *Legs* testaceous; a black dot on each of the trochanters. *Abdomen* blackish; middle of terminal margin of last dorsal segment somewhat produced, obsoletely notched: from beneath this segment proceeds a short, truncate, testaceous lobe: app. inf. testaceous; the basal joint long, cylindrical, pubescent, gradually clavate at its tip; second joint short, thin, and spiniform, slightly curved: penis slender, cylindrical, the glans oval and capitate, unarmed. (Pl. IV. fig. 18.)

*Anterior wings* narrow, pale yellow, without markings; veins testaceous.

*Posterior wings* greyish subhyaline, the costal edge testaceous; veins fusco-testaceous.

I possess a male of this moderately small pale species, which presents no particular structural peculiarities, save that the second joint of the app. inf. is more spiniform than is usual.

#### STENOPSYCHE, *M'Lachlan*.

When I described this genus (Tr. Ent. Soc. Lond. ser. 3, vol. v. p. 264) I was acquainted with the ♂ only. I now possess also the ♀, which differs only in its larger size and dilated joints of the intermediate tarsi; the apex of the abdomen is produced, and there are two rather long narrow valves.

#### STENOPSYCHE GRISEIPENNIS, *M'Lachlan*.

The ♀, from Assam, in my collection measures 25 lines ( $=52$  mill.) in expanse of wings. In coloration it is similar to the ♂, save that the inner margin of the anterior wings has a broad whitish streak extending from the base to the anal angle.

A second ♂, from the "Snowy Valley," near Ningpo, China (*Mr. Pryer*), resembles the Indian type; but the grey reticulated markings of the anterior wings are more delicate and uniform, not united into blotches, the posterior wings less opaque.

#### SMICRIDEA, nov. gen.

*Calcaria* 1, 4, 4. Frons valida. Antennæ graciles, breves; articulo basali vix dilatato, perbrevis. Ocelli desunt. Palpi

maxillares articulo basali brevissimo, sub frontem occulto; 2° et 3° brevibus, subtriangularibus; 4° longiore, tenuiore; 5° perelongato, gracili, cæteris æquali: labiales parvi. Pedes graciles, pubescentes; ♀ tibiis tarsisque paullo dilatatis. Abdomen parvum. Alæ anticæ pubescentes, elongatæ, ad apicem vix latiores, valde obtusæ; cellula discoidali parva, oclusa; cellulis apicalibus 1, 2, 3, 4, et 5 adsunt: posticæ anticis latiores, obtusæ; radio cum sectore 1° conjuncto; cellula discoidali oclusa, cellulis apicalibus 2, 3, et 5 adsunt.

*Head* moderate, densely clothed with pubescence: vertex rounded, the posterior margin with a large elongate tubercle on each side: front, below the antennæ, strongly developed and somewhat overhanging, truncate or emarginate: eyes moderate: ocelli absent: antennæ not longer than the wings, very slender, the basal joint short, and but little thickened, each joint of the thread slightly swollen internally at its apex, thus giving an indistinctly serrate appearance: maxillary palpi with the first joint very short and concealed under the front of the head; second and third joints short, subequal, somewhat triangular; fourth joint longer and more cylindrical; fifth very long and slender, equalling the others united: labial palpi very small. *Mesothorax* short and robust. *Abdomen* short; the males provided with well-developed app. sup. and inf. *Legs* moderate, pubescent, the tibiæ and tarsi of the intermediate pair only very slightly dilated in the female; anterior tibiæ with only one, short, robust, apical spur; intermediate and posterior tibiæ each with two pairs of long and more slender subequal spurs.

*Anterior wings* long, moderately narrow, of nearly uniform width throughout, the apical portion being very little dilated, apex very obtuse, the apical margin oblique and very slightly rounded, costal and inner margins nearly straight; clothed with short dense pubescence; longitudinal veins rather strong; transverse veinlets very indistinct, and for the most part transparent; subcosta and radius straight, running nearly parallel, both reaching the costa far before the apex; apical forks 1, 2, 3, 4, and 5 all present, 4 very long, 1 and 2 not reaching the anastomosis; discoidal cell small and narrow, closed; median cell (see *antè* p. 123) longer and broader; sutural area very broad, owing to the inner margin not being concave. *Posterior wings* one-fourth shorter than the anterior, much broader; costal margin slightly concave or sinuate; apex broadly rounded; subcosta short, extending only to the middle of the costal margin, or slightly beyond; radius running very close to the subcosta, but becoming confluent with the first apical sector just after the insertion of the veinlet closing the discoidal cell; apical forks 2, 3, and 5 present.

A genus of small insects, of which I possess three species from North and South America. Distinguished from all described genera of Hydropsychidæ (excepting possibly some insects at present grouped in *Macronema*) by the anterior tibiæ being only unicalcarate; with somewhat the facies of small species of *Hydropsyche*, but shorter and broader in form, the anterior wings being less elongate.

*SMICRIDEA FASCIATELLA*, n. sp. *S. fusca*. Caput cinereo fuscoque pilosum. Antennæ fuscæ, albido semiannulatæ. Pedes flavescens; tibiis, præcipue posterioribus, fusco-hirsutis. Abdomen fuscum: maris appendices inferiores bis articulatæ, articulo ultimo deorsum curvato. Alæ anticæ fusæ, nivo bifasciatæ, basin versus nivo nebulosæ: posticæ fusco-fuliginosæ (♂ ♀).

Long. corp. 2 lin. (=4 mill.); exp. alar.  $5\frac{3}{4}$  lin. (=12 mill.).

*Hab.* Texas (*Belfrage*) (*in Mus. auct.*).

*Fuscous.* Head clothed with cinereous hairs, the two large posterior tubercles emitting brownish-black hairs: eyes deep black: antennæ fuscæ, each joint above with a whitish spot, distinct only towards the base of the thread: palpi obscure yellowish or fuscous. *Mesonotum* fuscous, with a tuft of brownish-black hairs on each shoulder. *Legs* yellowish; the intermediate and posterior tibiæ, especially the latter, clothed with blackish or brownish hairs, principally on the outer side. *Abdomen* fuscous: in the ♂ the app. sup. seem to form two long straight blades closely applied one against the other; app. inf. long, two-jointed, directed upwards, clothed with fuscous hairs, the second joint short and acute, curved strongly downward; penis slender, cylindrical, obtuse, semipellucid: in the ♀ the extremity of the abdomen is furnished with a short subtriangular lobe projecting from the last dorsal segment and directed somewhat upward; on each side, below this, is a broadly obtuse lobe, little prominent.

*Anterior wings* smoky fuscous, almost blackish, with short golden pubescence; near the base is a white clouding, little distinct, and scarcely forming a broad fascia; beyond the middle a narrow, white, straight fascia, almost interrupted by the dark veins; and before the apex a similar fascia, which is slightly incurvated on the costal and inner margins; these markings are caused by white pubescence, and do not affect the membrane; the veins are dark; the subcosta extending slightly beyond the middle of the costa; the median cellule commencing before the discoidal, and extending to its middle. *Posterior wings* smoky blackish, with concolorous fringes; the costal margin rather irregularly sinuate; the subcosta joining the margin before the middle. (Pl. IV. fig. 19, details.)

I possess five examples taken by Mr. Belfrage in Texas in July and October.



**SMICRIDEA SAUCIA**, n. sp. *S. fusco-nigra*, aureo-pilosa. Antennæ nigrae. Pedes sordide testaceæ, tarsi fusciscentibus. Abdomen fusco-nigrum; app. sup. maris truncatis; app. inf. unguiformibus, incurvatis, acutis. Alæ anticæ fusca, pube aureo-brunnea dense vestitæ: posticæ fuliginosæ, subhyalina, iridescentes, fusco fimbriatæ et vestitæ.

Long. corp. 2 lin. (=4 mill.); exp. alar.  $5\frac{3}{4}$  lin. (=12 mill.).

*Hab.* Peru (Edwards) (in mus. auct.).

Blackish fuscous. *Head* clothed with golden pubescence: antennæ and palpi black or blackish fuscous; the former have each joint somewhat swollen internally at its apex: eyes blackish. *Legs* dull testaceous, the tarsi slightly infusate. *Abdomen* blackish: ♂ app. sup. band-shaped, nearly semicircular, truncate or slightly excised at the apex; app. inf. longer, claw-shaped, much incurvated, the tips acuminate and acute, turned downward.

*Anterior wings* fuscous, densely clothed with short golden-brown pubescence; veins dark; the subcosta joins the costa beyond the middle; the median cellule commences much before the discoidal, and extends slightly beyond it. *Posterior wings* smoky blackish, iridescent, with blackish fuscous pubescence and fringes; the subcosta extends beyond the middle of the costa. (Pl. IV. fig. 20, details.)

I possess about eight examples, taken by Mr. H. Edwards in Peru, probably in the neighbourhood of Lima.

**SMICRIDEA MURINA**, n. sp. *S. nigra*. Caput cinereo-pilosum. Antennæ pallide griseæ, nigro annulatæ. Pedes pallide flavi, flavo hirsuti. Abdomen fuscum: maris appendices inferiores elongatæ, graciles, bis articulatæ; articulo secundo valde deorsum curvato. Alæ anticæ aureo-murinae; punctis nonnullis in medio fuscis; fascia lata ante apicem flavo-albida: posticæ griseæ, griseo-fimbriatæ (♂ ♀).

Long. corp. 2 lin. (=4 mill.); exp. alar.  $6\frac{1}{4}$  lin. (=15 mill.).

*Hab.* Chili (Read) (in mus. auct.).

Black. *Head* clothed with cinereous hairs; those on the tubercles darker: antennæ pale greyish, with a distinct black ring at the apex of each joint; internally the joints bear a minute spine at the apex of each: eyes brown: palpi fuscous. *Legs* pale yellow, clothed with yellow hairs, which become dusky on the outside of the tibiae. *Abdomen* fuscous: in the ♂ the inferior appendices are long and slender, two-jointed, the second joint rather long, curved strongly downward, not pointed (the abdomen is injureo, so that I cannot define the general arrangement of the apical parts): in the ♀ there is a short projecting lobe at the apex above, and a broadly rounded valve on each side.

*Anterior wings* more elongate at the apex than in the preceding species; mouse-grey, with golden pubescence; in the middle are several darker



fuscous spots, not very distinct, placed on the transverse nervules and at the furcations, and these nervules appear to be slightly raised; about these spots is some pale clouding; before the apex a broad, but not conspicuous, transverse fascia caused by pale yellowish-white pubescence; the veins fuscous; the subcosta extending far beyond the middle of the costa; the median cellule commencing far before the discoidal, but not reaching to its end. *Posterior wings* pale grey, with grey pubescence and fringes (in these wings I am unable to define the exact course of the subcosta or the position of the veinlet closing the discoidal cell, and have, therefore, indicated them by dotted lines in the figure, Pl. IV. fig. 21, details).

I have one ♂ and one ♀ of this species.

### TINODES, *Leach*.

*TINODES CONSUETA*, sp. nov. *T. fusca*, aureo-pilosa. Pedes pallide flavi, coxis, femoribusque anticis intus, fuscis. Abdomen fusco-testaceum; appendicibus superioribus linearibus paullo curvatis, inferioribus ad basin marginis, supra processu elongato curvato, infra spinula instructis; lobo superiore mediano magno, triangulari, supra carinato. Alæ anticæ flavo-fuscæ, dense aureo-pubescentes: posticæ infumate, subhyalinæ (♂).

Long. corp.  $2\frac{1}{4}$  lin. (=5 mill.); exp. alar.  $7\frac{1}{2}$  lin. (=15 mill.).

*Hab.* California (*in mus. auct.*).

Blackish fuscous. *Head* and *thorax* clothed with pale golden hairs; eyes greyish yellow in their upper portion, blackish in the lower; antennæ fuscous, somewhat ochreous, more or less annulated with paler; palpi fuscous. *Legs* pale yellow; the coxæ, the anterior femora beneath, and sometimes the other femora (also beneath) fuscous. *Abdomen* fuscous, more or less testaceous or ochreous (colour probably altered), appendices pale; app. sup. long, scarcely curved, hairy, and linear; app. inf. two-jointed, the basal joint forming a broad base, excised above, and the lower angle produced into a short curved spine, the second joint forming a curved finger-shaped appendage arising from the excision of the basal joint; above there is a very large, broadly triangular median lobe placed between the app. sup., the middle with a distinct elevated carina, the sides sloping downward.

*Anterior wings* long, gradually widening from the base; the apex elliptical, dingy yellow, with dense golden-yellow pubescence, the naked circular space near the base scarcely evident; fringes golden grey; neuration arranged as is usual in *Tinodes*, greyish fuscous. *Posterior wings* greyish smoky, subhyaline, and with green reflections; fringes grey. (Pl. IV. fig. 22, details.)

I have four ♂, received from Mr. H. Edwards. It is a true *Tinodes* of quite the European type, the species being recogni-

zable by the broad triangular superior median lobe, which is carinated above. As a rule, the species of the genus, which are probably as numerous in North America as in Europe, can only be separated by the abdominal characters. *T. (?) livida*, Hagen (N. Amer. Neurop. p. 295), is unknown to me. I once saw the type of *T. (?) hirtipes*, Curtis, and noted that it was an *Apantania*, a genus belonging to another family.

## Fam. RHYACOPHILIDÆ.

### AGAPETUS, Curtis.

*AGAPETUS CELATUS*, n. sp. *A. fuscus*. Caput thoraxque flavo-hirsuti.

Pedes fusci, femorum apicibus luteis; tibiis posterioribus griseo-fimbriatis (tibiis tarsisque intermediis ♀ valde dilatatis). Abdomen fuscum, segmento antepenultimo ventrali ♂ ♀ unidentato. Alæ anticæ nigricantes, brunneo-pilosæ, nigro-brunneo-fimbriatæ: posticæ nigro-fuliginosæ, micantes, griseo-fimbriatæ (♂ ♀).

Long. corp.  $1\frac{3}{4}$  lin. ( $=3\frac{1}{2}$  mill.); exp. alar.  $5\frac{3}{4}$  lin. ( $=12$  mill.).

*Hab* California (*in mus. auct.*).

*Blackish-fuscous. Head and prothorax* clothed with golden or yellow hairs; ocelli whitish yellow; palpi and antennæ blackish-fuscous. *Legs* fuscous, trochanters and tips of the femora yellowish; in the ♂ the posterior tibiæ are fringed with long grey hairs; in the ♀ the intermediate tibiæ and first tarsal joint are strongly dilated, concave internally, and fringed with grey hairs. *Abdomen* fuscous; in the middle of the antepenultimate ventral segment in the ♂ is an obtusely triangular short tooth, not extending beyond the margin of the segment, and a somewhat similar, but shorter and broader, tooth is also seen in the ♀; there is no tooth or tuft of hairs on the penultimate segment: in the ♂ the app. inf. are elongately triangular, curved inwards at the tips, rather widely separated when viewed from beneath, fringed with yellow hairs externally; when viewed from beneath there is an appearance of two small points projecting from the inner side of the app. inf. close to their tips; these are probably the apices of the penis-sheaths, and not connected with the app. inf.; the penis-cover seems to consist of one large piece placed above the app. inf. and nearly reaching their tips (these anal parts are so strongly applied one against the other in the dry example, that it is impossible to describe them with certainty); in the ♀ the abdomen ends in a slender ovipositor, which is curved downwards.

*Anterior wings* uniformly blackish, somewhat shining, with a moderately dense clothing of short brownish pubescence and long blackish fringes; veins blackish. *Posterior wings* blackish, subhyaline, and with

purple reflections; fringes long and grey; veins blackish. (Pl. IV. fig. 23, details.)

I have one ♂ and two ♀ from California, sent by Mr. Henry Edwards. The insect is a true *Agapetus* in every respect. The species of this genus are all small and obscure, and can only be separated by the forms of the ventral tooth or teeth, and of the appendices of the male; and even then, to ensure certainty, it is advisable always to examine living specimens when that is possible.

### EXPLANATION OF THE PLATES.

#### PLATE II.

- Fig. 1. *Grammataulius brevilinea*, M'Lach., ♀, appendices, from side.  
 2. *Stenophylax limbatus*, M'Lach., ♂, appendices, from side.  
 3. *Neophylax concinnus*, M'Lach., ♂, neuration of wings; 3 *a*, maxillary palpus; 3 *b*, labial palpus; 3 *c*, appendices, from above; 3 *d*, extremity of abdomen and appendices, from beneath; 3 *e*, app. intermed., more enlarged.  
 4. *Notidobia griscola*, M'Lach., ♂, neuration of wings; 4 *a*, appendices, from side; 4 *b*, app. inf., seen internally, more enlarged; 4 *c*, ♀, extremity of abdomen, from above.  
 5. *Notidobia nigricula*, M'Lach., ♂, appendices from side; 5 *a*, app. inf., seen internally, more enlarged.  
 6. *Nosopus podager*, M'Lach., ♂, neuration of wings; 6 *a*, head; 6 *b*, anterior leg; 6 *c*, appendices, from above.  
 7. *Dinarthrum ferox*, M'Lach., ♂, neuration of wings; 7 *a*, head; 7 *b*, appendices, from side.  
 8. *Perissoneura paradoxa*, M'Lach., ♀, neuration of wings; 8 *a*, basal portion of antenna; 8 *b*, maxillary palpus; 8 *c*, labial palpus; 8 *d*, extremity of abdomen, from beneath.

#### PLATE III.

- Fig. 9. *Ascalaphomerus finitimus*, M'Lach., ♂, neuration of wings; 9 *a*, head; 9 *b*, maxillary palpus; 9 *c*, labial palpus; 9 *d*, appendices, from above; 9 *e*, appendices, from side; 9 *f*, app. inf., from beneath, more enlarged; 9 *g*, ♀, head; 9 *h*, extremity of abdomen, from above; 9 *i*, the same, from beneath.  
 10. *Heteroplectron californicum*, M'Lach., ♂, neuration of wings; 10 *a*, basal portion of antenna; 10 *b*, maxillary palpus; 10 *c*, labial palpus; 10 *d*, posterior leg; 10 *e*, appendices, from above.  
 11. *Ganonema vicarium*, Walk., ♂, appendices, from side.  
 12. *Ganonema mollicutum*, M'Lach., ♂, appendices, from side.  
 13. *Setodes argentifera*, M'Lach., ♂, neuration of wings; 13 *a*, appendices, from side.

Fig. 14. *Macronema polygrammatum*, M'Lach., ♂, wings.

15. *Macronema digramma*, M'Lach., ♂, wings.

#### PLATE IV.

Fig. 16. *Hydropsyche colonica*, M'Lach., ♂, appendices, from side; 16 *a*, extremity of penis, from side, more enlarged.

17. *Hydropsyche mauritiana*, M'Lach., ♂, appendices, from side; 17 *a*, extremity of penis, from above, more enlarged.

18. *Hydropsyche modica*, M'Lach., ♂, appendices, from side; 18 *a*, extremity of penis, from side, more enlarged.

19. *Smicridea fasciatella*, M'Lach., ♂, neururation of wings; 19 *a*, maxillary palpus; 19 *b*, appendices, from side; 19 *c*, ♀, extremity of abdomen, from side.

20. *Smicridea saucia*, M'Lach., ♂, neururation of wings; 20 *a*, appendices, from above.

21. *Smicridea murina*, M'Lach., ♂, neururation of wings; 21 *a*, app. inf., much enlarged; 21 *b*, ♀, extremity of abdomen, from side.

22. *Tinodes consuta*, M'Lach., ♂, neururation of wings; 22 *a*, appendices, from above; 22 *b*, the same, from side.

23. *Agapetus celatus*, M'Lach., ♂, neururation of wings; 23 *a*, extremity of abdomen and appendices, from side.

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Notes on the White-beaked Bottlenose, *Lagenorhynchus albirostris*, Gray. By JAMES MURIE, M.D., F.L.S., &c., late Prosector to the Zoological Society.

(PLATE V.)

[Read November 17, 1870.]

THE literature concerning this species of Dolphin dates from 1846, when Mr. Brightwell\* figured a female taken near Yarmouth under the name of *Delphinus tursio*, but which Dr. Gray† immediately afterwards showed to be a species new to science, and named it as now known. Another contributor was Eschricht‡, who described as *Delphinus Ibsenii* what appears either this identical species, or but a variety of it, distinguished by a somewhat narrower beak, smaller-sized and more numerous teeth. The venerable Nilsson adopted Eschricht's determination in the 'Scandinavian Fauna.'

\* Ann. & Mag. Nat. Hist. vol. xvii. p. 21, pl. ii.

† *Ibid.* p. 35, pls. x., xi., and Zool. 'Erebus and Terror.'

‡ Kongl. Danske Selskab. Kjöbenh. 1847.







